

# IMPORTANCE OF COI STUDIES IN THE HEALTH CARE-RELATED DECISION-MAKING PROCESS THROUGH THE EXAMPLE OF RHEUMATOID ARTHRITIS

Bence Nagy<sup>1</sup>, Eszter Kovács<sup>1</sup>  
<sup>1</sup>Healthware Consulting Ltd.



## INTRODUCTION

The economic burden of chronic diseases is high due to the permanent disease's progression and the need of lifelong health care services. The economic burden of chronic diseases is divided by patients and their families, health insurance, state and society in different proportion.

Knowledge of the costs of an illness can help policy makers to decide which diseases need to be addressed first by health care and prevention policy. The micro- or macro-level decision of resource's allocation defines the distribution of economic burden among stakeholders. In the macro-level decision-making (e.g. allocation of resource of government budget among each sector) societal perspective is dominant. In the micro-level decision-makers reflect them own budget from financier perspective.

Cost-of-illness (COI) studies aim to assess the economic burden of health problems on the population overall, and they are conducted for an ever widening range of health conditions and geographical settings. While they attract much interest from public health advocates and healthcare policy makers, inconsistencies in the way in which they are conducted and a lack of transparency in reporting have made interpretation difficult, and have ostensibly limited their usefulness. COI is able to evaluate the direct, indirect and intangible costs of a given disease in monetary terms in different perspectives (e.g. societal, public payer, patient, cross-national). Depending on perspective, it consists of different elements, and it values identical cost contents in different ways. The societal perspective takes account of all cost factors from the point of view.

## OBJECTIVES

COI can become usable decision support tool for a decision making of health care financing on micro-level in societal perspective if it has a uniform, objective methodology and a comparable results. The trends of previous years in Hungary increase the value of COI studies of societal perspective. Several methods are available for the evaluation of the chronic diseases' total costs in societal perspective COI studies.

In this analysis, our aim was through the example of the chronic disease rheumatoid arthritis

- to present and compare the results of COI studies with different design and structures from different data resources
- to estimate and compare the indirect cost of rheumatoid arthritis (RA) from different approaches
- to analyze the conditions and limitations of societal perspective COI's application in the healthcare-related decision-making process in Hungary

## METHODS

Direct costs are costs directly linked to the treatment, detection, prevention or care of an illness. They are further separated into medical cost, i.e. costs that occur in the health care sector, and non-medical costs that occur in other sectors, such as social services, community or patients themselves. Other nonmedical costs such transportation, social services, etc are integrated into direct costs.

Indirect costs are production losses that result as a consequence of an illness, premature death or treatment of an illness. These definitions are used in most studies, but there is some discussion as to whether informal care should be considered a direct or an indirect cost. Informal care costs can be estimated in three different ways: production losses for those carers who work, replacement cost using as proxy the cost of professional carers, or loss of leisure time for all carers.

The potential applicability of COI in societal perspective is analyzed with the comparison of indirect cost value and ratio among Hungarian RA patients from COI studies with different design and data resources. The value and ratio of indirect cost of RA in Hungary was estimated in three different methodological approaches:

1. Systematic literature research on PubMed database at 2011.02.01.
2. Estimation from public macro data -'top down'. The top-down approach measures the proportion of a disease that is due to exposure to the disease or risk factor.
3. Questionnaire survey was conducted among Hungarian RA patients with societal perspective - 'bottom up'. The bottom-up approach estimates costs by calculating the average cost of treatment of the illness and multiplying it by the prevalence of the illness. Estimation from micro sources.

## RESULTS

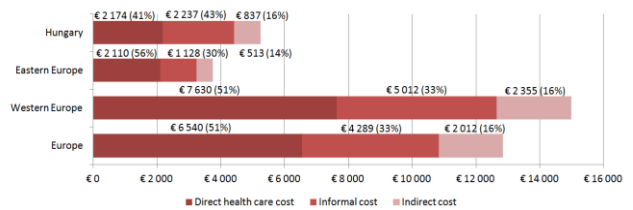
Based on the systematic literature research there were 357 findings for „Rheumatoid arthritis AND cost of illness“. After multiple selections 12 relevant articles were involved. Studies used a wide range of sources (patient interviews, local register, hospital data or clinical study reports), which resulted a strong limitation of comparison or meta-analysis. An international analysis Kobelt et al [1] found the most relevant for an international comparison, where based on epidemiology and macro data estimated average cost of RA.

## REFERENCES

1. Kobelt G., Kasteng F. (2009). Access to innovative treatments in rheumatoid arthritis in Europe. <http://www.lif.se/default.aspx?id=44400>
2. Central Administration of National Pension Insurance: Statistical Yearbook 2008, 2009, 2010 [http://www.onyf.hu/?module=news&fname=onyf\\_left\\_menu\\_kiadvany&root=ONYF](http://www.onyf.hu/?module=news&fname=onyf_left_menu_kiadvany&root=ONYF)
3. National Rehabilitation and Social Affairs Office: Statistical report 2008, 2009, 2010 <http://nrshz.kormany.hu/statistikai-evkonyvek>

Figure 1 shows, there is a wide range in Europe on the average cost per patient in the amounts (3 700 – 15 000 €) and also in the structure of costs elements (i.e. informal costs: 30-43%). The cost analysis was undertaken for Hungary as well, and the informal costs found on a relatively high proportion. The prevalence was found 37 907 patients and the indirect and informal care's costs were found 837 € and 2 237 € at 2008.

Figure 1. Average cost of RA, 2008 [1]



With the second 'top-down' approach the costs of RA were defined from different public sources. Direct medical costs were clarified on the National Health Insurance Fund and Administration (NHIFA) database. NHIFA database uniquely includes health care utilization data (pharmaceutical, in- and outpatient care services, labs, diagnostics, medical aids, sickness benefit) of the total population of Hungary. Since 2004, all financed health care services are strictly validated and use the same database structure. The representative data base covers the 10 million whole Hungarian populations. Disability pension because of early retirement was specified on the published sources of the Central Administration of National Pension Insurance (CANPI) and the National Rehabilitation and Social Affairs Office (NRSOA). [2] [3]

Table 1. Public macro data for indirect cost of RA, 2008

Category	Data	Source
Treated RA patients	44 129	NHIFA
Number of RA patients on sickness benefit	2 850	
Average cost sickness benefit per RA patients	€ 47.8	
Sum cost of sickness benefit at all RA patients	€ 2 110 534	
Estimated number of RA patients in early retirement	3 300-6 900	CANPI & NRSOA
Average cost of early retirement per RA patients	€ 291.3 - € 549.7	
SUM cost of early retirement all RA patients	€ 10 743 413 - € 22 147 075	

NHIFA: National Health Insurance Fund and Administration  
 CANPI: Central Administration of National Pension Insurance  
 NRSOA: National Rehabilitation and Social Affairs Office

Estimated average cost of early retirement was calculated with the average amounts of early retirements from CANPI and RA specific prevalence was established from the NRSOA database. Results demonstrated a much lower value for non-direct cost than it was established by Kobelt. At NHIFA financing database 44 129 subjects were detected. The cost of sickness benefit was only 48 €, while the estimated costs of early retirement found between on a quiet wild range (291 – 550 €). These non-direct costs represent a payers' perspective and explain the lower values.

Finally with the third 'bottom-up' approach the questionnaire survey was undertaken at 2011. 123 patients filled in our questionnaire form. Patients were managed by Patient Organizations. Subject did not receive any honorary.

Table 2. Main results of RA patient's questionnaire 2011

Category	Data
Sample	123
Mean age (SD)	59 (11)
Patients below 60	63%
Disease duration (year)	16
Proportion of women	64%
Employed or self-employed	22%
Early retired due to RA	27%
Average cost of sickness benefit per RA patient (converted to € 2008)	€ 203.5
Average cost of early retirement per RA patient (converted to € 2008)	€ 1 563.9

Table 3. Comparison of indirect cost of RA in different approaches

	1. Literature review	2. Estimation from public macro data	3. Patient's questionnaire
<b>Indirect cost per RA patients</b>			
Sickness benefit (short or long)	NA	€ 47.8	€ 203.5
Early retirement	NA	€ 243.5	€ 1 563.9
Indirect cost sum	€ 837.0	€ 549.7	€ 1 767.5
<b>Indirect cost of all RA patients</b>			
Sickness benefit (short or long)	NA	€ 2 110 534	€ 8 982 076
Early retirement	NA	€ 10 743 413	€ 22 147 075
Indirect cost sum	€ 31 728 159	€ 12 853 947	€ 24 257 610

The comparison of the listed resources alongside identical dimensions indicates that the tendencies are similar although there are significant differences in the order of magnitude.

It is hard to compare the results of the three different methodological approaches, because of significant differences on the amount. Different approaches could eventuate a wide scope of answers, even if they used the same sources.

## CONCLUSIONS

Decisions about healthcare resource allocations affect social welfare. In reimbursement decisions the NHIFA uses the financier perspective, but in the ranking and evaluation of health technologies and therapies the societal perspective represents the basis for optimization. In Europe pharmacoeconomic guidelines are commonly used and widespread, and declare all relevant parameter-selection and modeling criteria. COI studies can help in the identification of decision-making focal points, although this necessitates the assessment and standardization of the applicable methodologies.