HEALTHWARE

Actualities of Hungarian pharmaceutical financing market

Newsletter
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News, current issues

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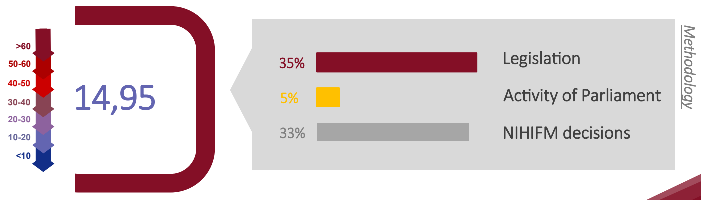
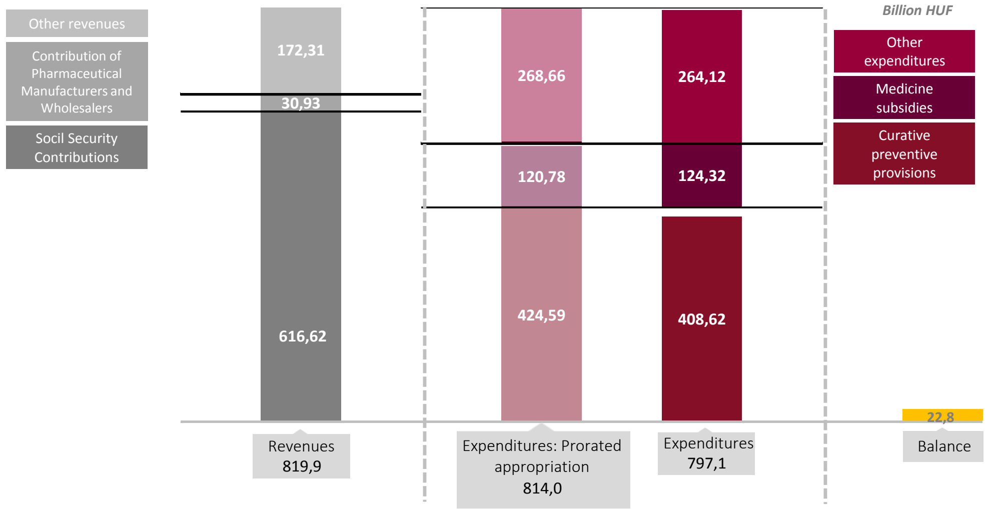
- News — Anticipatory fundraising missing from healthcare »
- News — State Audit Office: the current healthcare financing is not sustainable »

Decision-making index, April 2019



Macro approach to financing healthcare and medicinal products

Balance of the Health Insurance Fund, April 2019



Source: Healthware analysis based on NHIFA data

Product offering

Survey of references, meta – analysis

We collect the available information, evidence in related articles, directives, studies, research.

As the first step of systematic research of the scientific literature we define the relevant keywords. Then we present the evidence charts, it is followed by organization and comparative analysis.

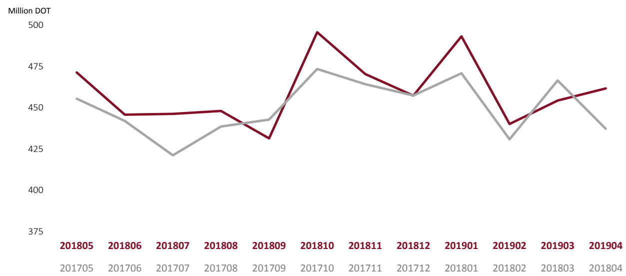
Meta – analysis

We are able to make an exact summary of the results with statistical methods, which is based on the systematic research of scientific literature that led to compiling the parameters of evidence charts.

More details: link

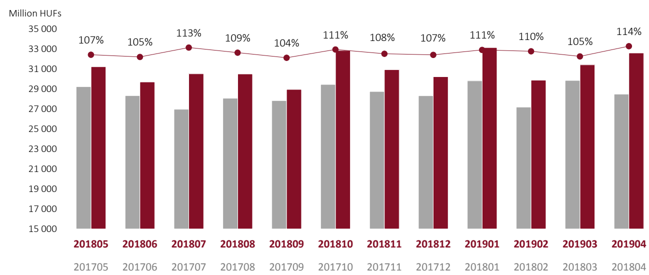
Dynamics of the sales/circulation of prescription-only-medicine

Pharmacy DOT turnover



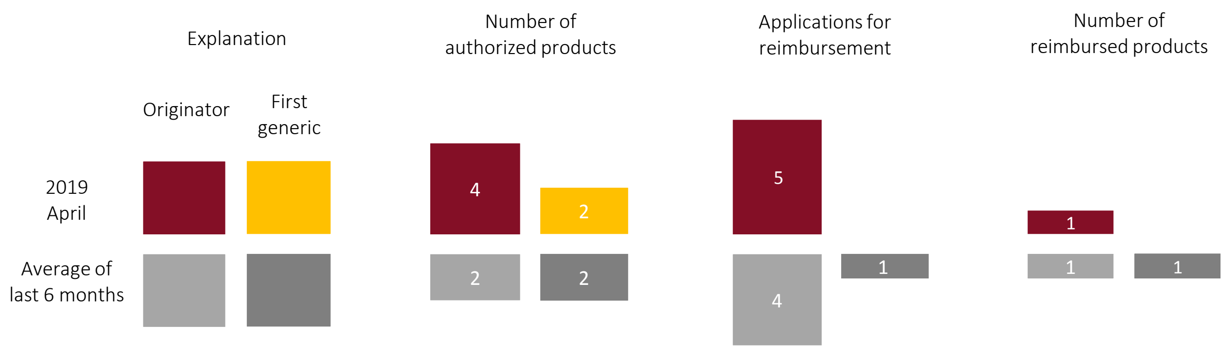
Source: Healthware analysis based on NHIFA data

Pharmacy reimbursement turnover



Source: Healthware analysis based on NHIFA data

Changes to subsidized medicinal product categories, April 2019



Source: Healthware analysis based on NHIFA data

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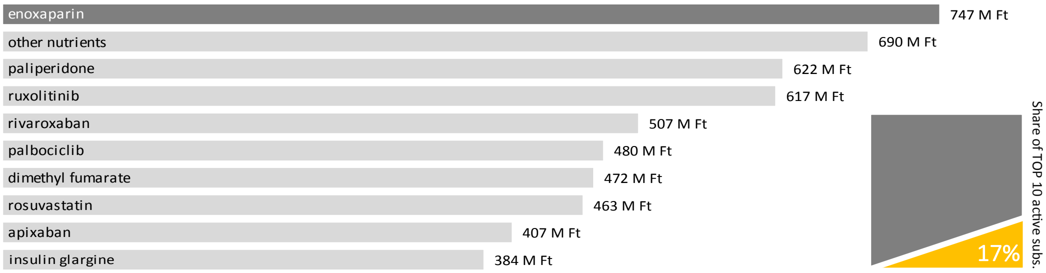
Market data

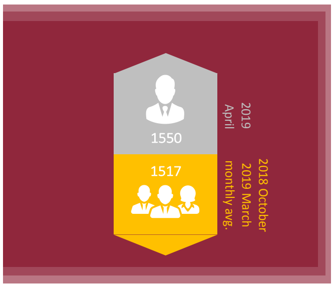
Toplists of reimbursement and number of patients, April 2019

TOP 10 ATCs by all reimbursement paid



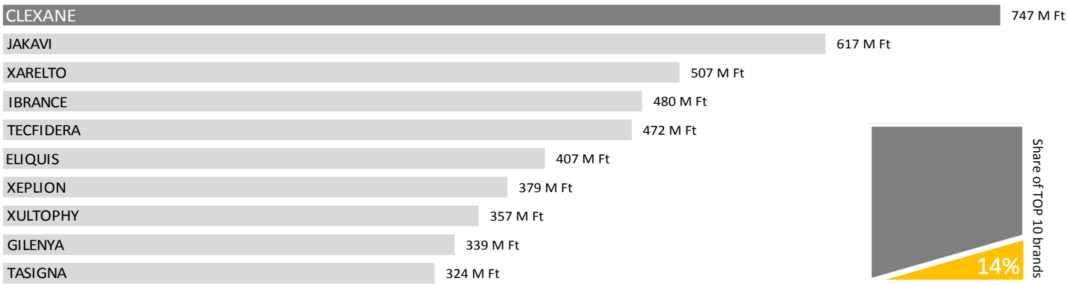
Source: Pharmacy turnover data, Healthware analysis

Average number of medical sales reps



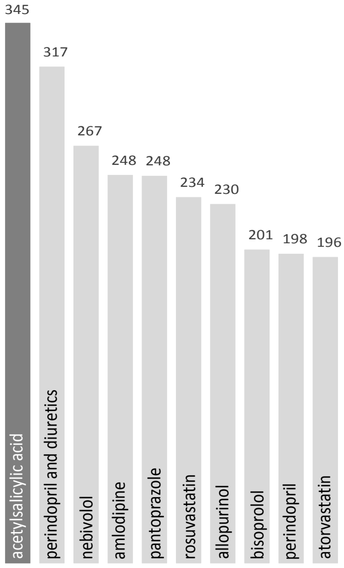
Source: NHIFA data, Healthware analysis

TOP 10 brands by all reimbursement paid

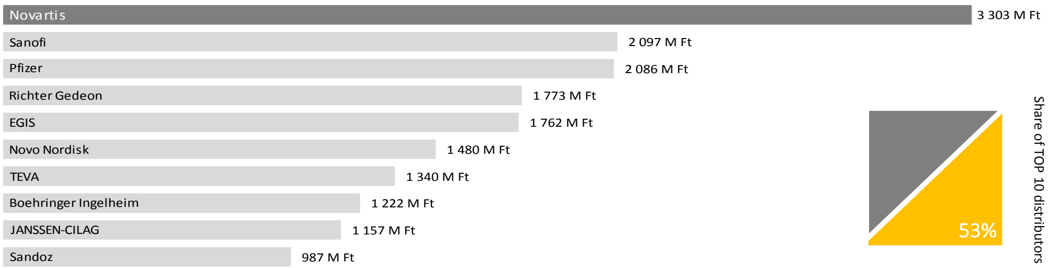


Source: Pharmacy turnover data, Healthware analysis

TOP 10 active substances by number of patients (thousand patients)



TOP 10 distributors by all reimbursement paid



Source: Pharmacy turnover data, Healthware analysis

Source: Pharmacy turnover data, Healthware analysis

Decreasing cost burden of diabetes using cost-optimal control charts — case study

Cost-optimal control charts are traditionally used in industrial statistics, but in the past decades they started to appear in other areas as well. This tool is used for the monitoring and controlling of a process. Similar tasks also appear in healthcare such as the monitoring of blood lipid or sugar levels. We have adapted these traditional control charts in a way to enable them to model random degradation and therapies of different efficiency.[1] Control charts work with a complex model which incorporates the disease progression and treatment. This model can be used to find the optimal parameters which entail the lowest possible costs. The model includes not only the medically and statistically relevant viewpoints, but also all the relevant costs. Namely, we took into account the sampling, treatment and relevant event costs altogether.

The focus of the analysis was the assessment of the relationship between the haemoglobin A1c (HbA1c) level and the various costs. Data was gathered through the National Health Insurance Fund and South-Pest Hospital Centre. Those patients were included in the study who had diabetes diagnosis (ICD: E10/E11/E14) and at least one recorded HbA1c level. We analysed the effect and cost of oral antidiabetics and insulin therapies (together). We will simply refer to these as “therapies”. It is also possible to compare different therapies with control charts, but this is out of the scope of this case study.

The effectiveness of the therapies was assessed by comparing the original and decreased HbA1c levels in case we observed decrease during an ongoing therapy. It is important to note that this calculation only takes into account the relative effectiveness and disregards the actual state of the patient. The results show that there is usually only a mild decrease in consecutive HbA1c samplings. Next, we analysed the relationship between the daily therapy costs and the HbA1c level. We found that the costs increase with the HbA1c level, but the rate of this increase lessens at high HbA1c levels. When analysing the effect of the HbA1c level on healthcare event costs, we took into account all the costs incurred in the six months following a given HbA1c level. The relationship between the HbA1c level and the healthcare event costs is relatively weak, but it is worth noting that these are daily costs, thus the cumulative costs can be of significant magnitude.

Sampling and visit costs were estimated using the relevant ICPM codes (the estimated average cost was 2875 HUF). The model also required data about the disease progression. We found that the state of the patients worsens on average every 200.24 days and this entails on average a 0.836% HBA1c increase.

According to the medical guidelines the critical HbA1c level (under which we would like to keep the patient) is 7%, and the average time between samplings was 231.88 days. The model assumes that a therapy, which is able to somewhat decrease the HbA1c level starts in case of a higher-than-critical HbA1c measurement. It turned out that a much better fit can be achieved (measured by the HbA1c distribution) by using 6% and 100 days as the model parameters. Thus we have gathered all the necessary parameters for building a control chart model.

The table shows the empirical and theoretic (calculated by the model) HbA1c and average daily cost statistics.

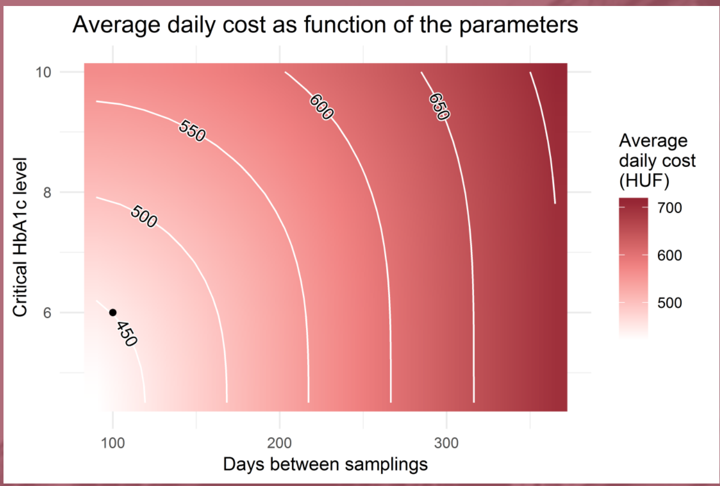
Statistics	HbA1c (%)		Total cost (HUF)					
			Empirical			Theoretic		
	Empirical	Theoretic	Therapy	Event	Sampling	Therapy	Event	Sampling
Mean			210,90	270,56	28,75	190,57	231,20	28,75
	7,11	7,25	510,21			450,52		
Std. Dev.	1,65	1,62	1166,82			65,71		

It can be seen that the average HbA1c level of the examined patients is 7.11% while the average total daily cost is 510.21 HUF. This cost includes the therapy, event and HbA1c sampling costs. The model estimated the costs and the HbA1c level well, but it significantly underestimated the cost standard deviation. The model lacks the tools to properly estimate the total standard deviation, currently it only takes into account the uncertainty of the HbA1c level. This is not a significant hindrance since we are interested in the average costs due to the HbA1c level, and the estimation of those numbers are satisfactory.

Given that the fit of the model was deemed to be good, it is now possible to assess how would to costs change with different parameter values. This cost-optimisation is the core of the method.

Decreasing cost burden of diabetes using cost-optimal control charts — case study

The figure shows the average daily cost as a function of the critical HbA1c level and the days between samplings on a contour plot.



The black dot on the left part of the figure shows the cost associated with the previously used 100 days and 6% parameters. This is a purely cost-optimal model which disregards e.g. the medical viewpoint. For example, the fact that HbA1c measurements should be at least three months apart can cause problems in the optimisation. Nonetheless, the figure can convey important information: it can be seen that more frequent samplings and lower critical HbA1c levels entail lower costs. It can also be assessed that the cost depends more on the sampling interval than on the critical HbA1c level. The figure also shows that the total increase in the cost is only moderate. It is important to note though that these are daily costs for one patient and in total they can result in great cost burden. If the model describes the changes and functions related to the HbA1c level correctly, then the previous findings suggest that frequent monitoring and increased adherence is of great importance. Based on the data, the time between HbA1c measurements is often far from optimal. This analysis can be repeated on therapies with different costs and efficiency, thus the comparison of different therapies is also possible.

[1]*Dobi, B., & Zempléni, A. (2019). Markov Chain-based Cost-Optimal Control Charts for Healthcare Data. arXiv preprint, arXiv:1903.06675.*