

The economic burden of poor adherence to statins in Belgium

A chapter of *Advancing the Responsible Use of Medicines in Belgium* report

Authors: Ramos M, Caekelbergh K, Lamotte M

¹IMS Health Consulting, Vilvoorde, Belgium

Introduction

"Drugs don't work in patients who don't take them"¹.

Medication adherence has been clearly described by Vrijens et al. 2012², as the process by which patients take their medication as prescribed.

Medication non-adherence, mostly in chronic treatment, is of increasing concern to clinicians as it is now well established that non-adherence to medication contributes to poorer or even adverse health outcomes, both in the short and long term (e.g., faster progression to co-morbid conditions, contribution to increased risk of mortality).

Further, the issue is now of growing concern among other healthcare stakeholders, such as payers and policymakers, due to the increasing evidence that non-adherence can result in higher costs of care, seldom offsetting the "savings" from not taking the drug.

Despite clinical guidelines in cardiovascular disease (CVD) reinforce the need for adequate management of risk factors as contributors to major adverse outcomes of CVD in patients who are at risk, adequate control of those risk factors is still far below the recommended targets in many countries. The EUROASPIRE (European Action on Secondary and Primary Prevention by Intervention to Reduce Events) has shown that the integration of cardiovascular disease prevention into daily clinical practice is still highly inadequate in Europe^{3,4,5}.

Methods

Sokol et al. 2005⁶ showed that patients (with diabetes, hypertension, hypercholesterolemia, and congestive health failure) who maintained an 80% to 100% medication adherence were significantly less likely to be hospitalized compared to patients with lower levels of adherence.

Hospitalization rates for five levels of medication adherence and additional likelihood of being hospitalized in the respective year if medication adherence be lower than 80-100% were provided (table 1).

To estimate the impact of non-adherence in Belgium, adherence levels to statins therapy based on IMS Health LifeLink Treatment Dynamics⁷ were determined in patients with a first or follow-up prescription for statins during the period January 2010-January 2013.

From this dataset we estimated:

- number of prescription re-fills
- total days covered by prescriptions - as the number of days between two prescription fills in which the patient could be assumed to use one pill per day, based on the pack size of the last prescription. Dividing the total number of days covered by the number of follow-up days for each patient resulted in a %-adherence level.

The number of avoidable hospitalizations corresponding to each adherence level was estimated

- As the difference between the risk of hospitalizations in patients at 80-100% adherence and the risk of hospitalizations in patients with less than 80% adherence
- To project to the full of Belgium a multiplication factor was determined based on the number of patients on statins in the IMS Health LifeLink Treatment Dynamics database⁷ (=310,601) and those reported in the Pharmanet report⁸ for Belgium (=1,439,276).

Table 1: Estimated avoidable costs of hospitalizations due to non-adherence compared to 80-100% patient adherence

Adherence Level	No. of pts. **	Hosp. risk	Avoidable hosp.	No. of avoidable hosp.	Total cost avoidable hosp.		Number of days on treatment	Extra numb. of days to reach optimal adherence	Drug cost related to current adherence	Extra drug cost to reach optimal adherence	
					Lower	Higher					
01-19%	240,209	15%*	3%	7,206	35,209,851	42,264,793	36	285	3,475,729	27,805,829	
20-39%	243,935	15%	3%	7,318	35,755,951	42,920,314	107	214	10,588,910	21,177,820	
40-59%	227,902	15%*	3%	6,837	33,405,820	40,099,291	178	143	16,488,222	13,190,577	
60-79%	217,735	14%*	2%	4,355	21,277,062	25,540,312	249	71	22,053,759	6,301,074	
80-100%	509,496	12%	0%	N/A	0	0	321	0	66,349,755		
Total	1,439,276			25,716						68,475,301	
Savings due to less hospitalizations					125,648,684	150,824,709					
Total savings taking into account hosp savings and extra drug					57,173,382	82,349,408					

* Statistical significant; ** Extrapolated to the Belgium population

Objectives

In our analysis, we aimed to quantify the potential economic implications for Belgium of non-adherence to cholesterol-lowering drugs (statins) from a payer perspective.

The total avoidable cost attributable to non-adherence was determined as the number of avoidable hospitalizations due to non-adherence multiplied by average cost of a hospitalization in Belgium in 2014. An upper (using the cost of CVD hospitalizations) and lower (using the cost of the average hospitalization) scenario are shown (table 2).

Apart from this cost, we also included the extra treatment cost that results from increasing the adherence level to 80-100% from its initial level (= 90% as the average between 80 and 100%).

As such, we assumed that

- The annual number of tablets of statins consumed and the yearly treatment costs were estimated for all levels of adherence.
- Each patient would receive one tablet per day.
- The cost of a tablet was calculated from IMS Health Belgian National Retail Database¹⁰ (=by dividing the total annual expenditure for statins by the total number of tablets consumed in 2014 - on average 0.4€ per tablet).

The additional cost due to increasing the adherence levels was defined as the cost difference between the current level of adherence and 80-100% adherence.

Hence, the total amount that could be avoided by increasing the adherence is given as the *difference* between the total avoidable cost and the additional treatment cost required to raise the adherence levels.

Table 2: Average cost of hospitalization in Belgium

	Assumptions	Average cost
Lower	All Patients Refined Diagnosis Related groups	€4,886 ⁹
Upper	APR-DRGs codes 160-180, 190-207	€5,865 ⁹

Results

- The average duration of follow-up in the panel was 871 days.
- Sixty-five percent of the anonymized patients in the panel were below the acceptable 80% adherence level (Table 1).
- 25,716 hospitalizations per year in Belgium are possibly attributable to the lack of optimal adherence to statins therapy

For the upper and lower cost per hospitalization in Belgium, the total avoidable costs related to only hospitalizations and if the levels of adherence would be raised to 80-100% are shown in figure 1.

Figure 1: Estimated savings



Conclusions

Poor adherence to statins prevents the therapy from achieving its purpose and exposes patients to the risk of adverse health events:

- cardiovascular and cerebrovascular events, peripheral vascular disease, and premature death
- patients are at high risk of requiring acute and long-term care in hospitals and specialized centres, leading to an additional burden to the healthcare system.

This study is a clear example that can be extrapolated to other chronic disease areas. All stakeholders (physicians and pharmacists) should commit to engage in increasing awareness of the risks associated with not adhering to medication as prescribed.

References

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- 10- IMS Health Belgian National Retail Database;