



## Cost of severe hypoglycaemia in nine European countries

Michał Jakubczyk, Izabela Lipka, Justyna Pawęska, Maciej Niewada, Elżbieta Rdzanek, Jelka Zaletel, Antonio Ramírez de Arellano, Tomáš Doležal, Biljana Chekorova Mitreva, Bence Nagy, Guenka Petrova, Tereza Šarić, John Yfantopoulos & Marcin Czech

To cite this article: Michał Jakubczyk, Izabela Lipka, Justyna Pawęska, Maciej Niewada, Elżbieta Rdzanek, Jelka Zaletel, Antonio Ramírez de Arellano, Tomáš Doležal, Biljana Chekorova Mitreva, Bence Nagy, Guenka Petrova, Tereza Šarić, John Yfantopoulos & Marcin Czech (2016): Cost of severe hypoglycaemia in nine European countries, Journal of Medical Economics, DOI: [10.1080/13696998.2016.1188823](https://doi.org/10.1080/13696998.2016.1188823)

To link to this article: <http://dx.doi.org/10.1080/13696998.2016.1188823>



Accepted author version posted online: 10 May 2016.



Submit your article to this journal [↗](#)



View related articles [↗](#)



View Crossmark data [↗](#)

Ask for the whole article at [iroda@healthware.hu](mailto:iroda@healthware.hu)

Full Terms & Conditions of access and use can be found at  
<http://www.tandfonline.com/action/journalInformation?journalCode=ijme20>

## Cost of severe hypoglycaemia in nine European countries

Michał Jakubczyk<sup>1</sup>, Izabela Lipka<sup>2</sup>, Justyna Pawęska<sup>2</sup>, Maciej Niewada<sup>3</sup>, Elżbieta Rdzanek<sup>2</sup>, Jelka Zaletel<sup>4</sup>, Antonio Ramírez de Arellano<sup>5</sup>, Tomáš Doležal<sup>6,7</sup>, Biljana Chekorova Mitreva<sup>8</sup>, Bence Nagy<sup>9</sup>, Guenka Petrova<sup>10</sup>, Tereza Šarić<sup>11</sup>, John Yfantopoulos<sup>12</sup>, Marcin Czech<sup>13,14</sup>

- 1 – Decision Analysis and Support Unit, Warsaw School of Economics, Poland,
- 2 – HealthQuest spółka z ograniczoną odpowiedzialnością Sp. K, Warsaw, Poland,
- 3 – Department of Experimental and Clinical Pharmacology, Medical University of Warsaw, Poland,
- 4 – University Medical Centre, Department of Endocrinology, Diabetes and Metabolic Diseases, Ljubljana, Slovenia,
- 5 – Novo Nordisk Pharma, Spain,
- 6 – Institute of Health Economics and Technology Assessment, Prague, the Czech Republic,
- 7 – Department of Pharmacology, 2nd Faculty of Medicine, Prague, the Czech Republic,
- 8 – Novo Nordisk Pharma, Macedonia, the former Yugoslav Republic of Macedonia,
- 9 – Healthware Consulting Ltd, Budapest, Hungary,
- 10 – Department of Social Pharmacy and Pharmacoeconomics, Faculty of Pharmacy, Medical University of Sofia, Bulgaria,
- 11 – Promeritus savjetovanje Ltd., Zagreb, Croatia,
- 12 – School of Economics and Political Science, University of Athens, Greece,
- 13 – Department of Pharmacoeconomics, Medical University of Warsaw;
- 14 – Business School, Warsaw University of Technology, Poland.

Corresponding author: Marcin Czech, marcin.czech@wum.edu.pl

Department of Pharmacoeconomics, Medical University of Warsaw, Zwirki i Wigury 81, 02-091 Warsaw, Poland

## **1 Transparency**

### **1.1 Declaration of funding**

The project was funded by Novo Nordisk.

### **1.2 Declaration of financial/other relationships**

The authors declare that they have no competing interests. There is no specific organization that may in any way gain or lose financially from the publication of this manuscript. No ethical committee approval was required for the present study. JME peer reviewers on this manuscript have no relevant financial or other relationships to disclose.

### **1.3 Acknowledgments**

The authors would like to acknowledge the following people: Thanos Chantzaras, Katalin Érsek, Roberta Montagnoli, Karel Rychna, Irina Ryzhenkova, Sanda Sandalj, Zsofia Tarjanyi and Vasil Valov for their helpful comments. Acknowledgments also go to Novo Nordisk, a sponsor of this project.

JUST ACCEPTED

## Abstract

**Objective:** Complications contribute largely to the economic gravity of diabetes mellitus (DM). How they arise and are treated differ substantially between countries. In this paper we assess the total annual, direct and indirect, cost of severe hypoglycaemia events (SHEs) in nine European countries: Bulgaria, Croatia, the Czech Republic, Greece, Hungary, Macedonia/the former Yugoslav Republic of Macedonia (MK), Poland, Slovenia, and Spain.

**Methods:** We collected data on epidemiology, treatment structure, SHE-driven resource consumption, and unit costs. We used two systematic reviews—on the SHE rates and the resources used for treatment—and data on the days-of-work lost due to SHE along with salaries and employment rates. We calculated the total SHE cost in each country and analysed how the differences are driven by individual parameters.

**Results:** The annual costs of SHEs varied in absolute terms from €379,951.25 in MK up to €58,429,684.40 in Spain, or—when expressed per one drug-treated DM patient—from €5.47 in Bulgaria up to €17.74 in Spain. Indirect cost constituted between 6.01% (MK) and 26.49% (Hungary) of the total cost. The differences between countries are driven mostly by the cost of treating a single event, and this is related to general differences in prices.

**Limitations:** The main limitation is the lack of good quality data in some parts, and the necessity to use mean-value imputations, experts' opinions, etc. Additionally, we only considered DM treatment as the SHE driver, while other elements, e.g. style of living, may contribute substantially.

**Conclusions:** A common framework can be applied to estimate the economic burden of SHE in various countries, allowing to identify the drivers of differences in cost. Treating DM is complex, and so no resolute conclusions ought to be drawn as to whether SHE management is better in one country than another.

Ask for the whole article at [iroda@healthware.hu](mailto:iroda@healthware.hu)