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Antiobesity drugs utilization trend analysis and reimbursement lists status – the perspective of selected European countries

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Abstract

Obesity is a chronic, complex, relapsing disease impacting healthcare systems and the economy worldwide. We aim to analyze the utilization trends of antiobesity drugs, and their reimbursement status on drug lists of health insurance funds (HIF) in selected European countries. The DDD/1000 inhabitants/day methodology is used for utilization trend analysis, where data from official national utilization reports were used. For the reimbursement status analysis of 5 antiobesity drugs (orlistat, semaglutide, liraglutide, naltrexone/bupropion, setmelanotide), the websites of national health insurance funds (HIF) of 22 European countries were screened. Trend analysis revealed fluctuation for almost all antiobesity drugs (the highest decrease seen for orlistat in Serbia, and the highest increase for liraglutide in Croatia). Novel antiobesity drugs show an increasing utilization trend in almost all the countries. In two out of three European countries,

antiobesity drugs are not covered by the HIF. Slovenia and Denmark reimburse most of the antiobesity drugs. The Netherlands is the only country where the cost of setmelanotide is paid by the HIF. Our results emphasize the importance of prioritizing the introduction and implementation of new strategies and reimbursement scheme models in global and national antiobesity policies.

Key words: obesity, drug consumption, DDD/1000 inhabitants/day, health insurance fund, reimbursement status

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Introduction

Obesity is a chronic, complex relapsing disease defined as a Body Mass Index (BMI) above 30 kg/m^2, whereas a BMI in the range of 25.0–29.9 is classified as pre-obesity (overweight). According to the World Health Organization (WHO), nutritional status categories based on the BMI are: *underweight*: < 18.5; *normal weight*: 18.5–24.9; *pre-obesity*: 25.0–29.9; *obesity class I*: 30.0–34.9; *obesity class II*: 35.0–39.9; *obesity class* III: > 40.0), while surgical classification defines three subtypes: *severe obesity* (> 40.0), *morbid obesity* (40.0–50.0) and *super obesity* (> 50.0) (1-4).

It is considered that overweight and obesity have reached epidemic proportions (5), where about 12% (5/41 million) of adult deaths caused by non-communicable diseases are driven by a BMI ≥ 25.0 (6). By 2035, 3.3 billion adults and 40% of children (5-19 years) are expected to be overweight or obese, and if no intervention is made, the prevalence of overweight and obesity in adults in the European region is expected to reach 71% (6). The global economic cost is predicted to be over US$ 3 trillion by 2030, and even six times more by 2060 (US$ 18 trillion) (7), where global economy will be reduced by over US$ 4 trillion in 2035, nearly 3% of global gross domestic product (8).

It is recognized that obesity is a growing worldwide problem for healthcare systems, and its global burden represents a threat to public health, undermining social and economic development, with the potential to increase inequalities (2, 9). A health services response to obesity must focus at three levels in the health system: primary (the general population), secondary (people at risk of obesity), and tertiary (established/controlled obesity) prevention (10).

Some of the most common comorbidities of obesity are diabetes mellitus type 2 (DMT2), prediabetes, coronary disease, polycystic ovarian syndrome (PCOS), dyslipidemia, metabolic syndrome, obstructive sleep apnea, osteoarthritis (OA), carcinoma, gastroesophageal reflux disease (GERD), and phycological disorders (3), where in practice it is hard to distinguish between comorbidities and conditions related to obesity as its complications.

Divino et al. quantified the cost of burden of 13 complications related to obesity (obstructive sleep apnea, PCOS, heart failure with preserved ejection fraction (HFpEF), urinary incontinence, OA of the knee, DMT2, prediabetes, asthma, psoriasis, GERD, hypertension, dyslipidemia, musculoskeletal pain), where the most costly complications were OA of the knee ($3,697/year), HFpEF ($3,586/year), and psoriasis ($2,711/year), showing that obesity-related complications are a significant contributor to the economic burden of obesity and highlighting the need for the treatment of obesity (11). Another study showed that 2/3 of the costs of obesity are related to indirect costs (69% to premature death, 31% to productivity loss), and only 32% are caused by medical and non-medical care costs (12).

The management of obesity is a complex procedure and includes changes in eating habits, physical activity, psychological support, pharmacotherapy, and/or surgical

treatment (3, 9). Anti-obesity drugs are indicated for patients with a BMI ≥ 30 kg/m^2 or a BMI ≥ 27 kg/m^2 with comorbidities (3), but it is not recommended to use them alone, without combining different approaches (nutritional, cognitive-behavioral, pharmacological, and surgical) (9). Drugs for obesity with marketing authorization issued by the European Medicines Agency are: orlistat, liraglutide, semaglutide, naltrexone/bupropion, and additionally, phentermine/topiramate, and tirzepatide in the United States of America (3, 13-16).

This paper aims to analyze utilization trends and reimbursement status of antiobesity drugs in selected European countries.

Material and methods

For the purposes of utilization trend analysis, a dataset based on utilization expressed in daily defined dose (DDD)/1000 inhabitants/day (official methodology recommended by the WHO) was created using the official reports of the competent regulatory bodies of the Republic of Serbia (period: 2007–2022) (17), the Republic of Croatia (period: 2007–2022) (17), Norway (period: 2007–2022) (19-24), Estonia (period: 2010–2022) (24–30), Latvia (period: 2010–2022) (25–27, 32), Lithuania (period: 2010–2018) (25-27) and Finland (period: 2018–2021) (33). These countries and covering periods were selected based on the public availability of their annual reports on drug utilization expressed as DDD/1000 inhabitants/day, in line with the WHO methodology. Utilization data levels in these reports may differ between countries (e.g., wholesaler level, pharmacy level). Accordingly, the extent of usage was not the focus of this research; instead, we analyzed the trend of antiobesity drug utilization over time.

We analyzed the trend of antiobesity drug utilization using the joinpoint regression software (34-35). The joinpoint regression method has been used to analyze drug utilization; it identifies the year(s) (points) when a significant annual percent change (APC) occurs over the defined period (36).

The selected utilization data (DDD/1000 inhabitants/day) were data on the 1st ATC level for A - Alimentary tract and metabolism, on the 2nd ATC level for A08 - Antiobesity preparations, excl. diet products, and on the 5th ATC level for drugs used to treat obesity, which are (were) available in the selected European countries: A08AA10 sibutramine, A08AA12 setmelanotide, A08AA62 bupropion and naltrexone, A08AB01 orlistat, A10BJ02 liraglutide, A10BJ06 semaglutide. Utilization data for liraglutide and semaglutide also included utilization for DMT2 indication, since utilization reports provide information on the international non-proprietary name (INN), not on the brand name (liraglutide is the active substance for Victoza (DMT2 indication), and Saxenda (obesity indication), semaglutide for Ozempic (DMT2 indication), and Wegovy (obesity indication).

For the reimbursement status analysis, a dataset was created using publicly available information from the 22 Health Insurance Fund websites of the European

countries (37-58), with the cutoff date of March 2024. Drugs authorized by the European Medicines Agency (EMA) for the indication of obesity were screened: orlistat (brand names: Alli (previously Orlistat GSK), Xenical), semaglutide (brand name: Wegovy), liraglutide (brand name: Saxenda), naltrexone/bupropion (brand name: Mysimba), and setmelanotide (brand name: Imcivree).

Results

Drug utilization trend analysis

Drug utilization trend analysis on the 1st ATC level (A - alimentary tract and metabolism) shows growth in all seven analyzed countries, with the highest growth in Estonia (2010-2016, APC=11.15, $p < 0.05$), and lowest in Estonia (2016-2022, APC =2.56). Trends of decrease show no statistical significance. Interestingly, the same country showed the highest and also the lowest growth trend in different periods, where additional analysis is needed to find the cause of this trend shift.

Sibutramine is the drug that was used from 2007 to 2011 in 3 of the selected countries (Croatia, Norway, and Serbia), with an increase in utilization only in Serbia (APC=126.16, $p < 0.05$). Moreover, naltrexone/bupropion was utilized in only 3 countries (Estonia, Norway, Serbia), starting in 2017, and a significant utilization increase was seen in Norway and Serbia, with more than 100 annual percent change seen (APC=108.13, $p < 0.05$; APC=134.52, $p < 0.05$, respectively). Orlistat and liraglutide are the only drugs that were utilized in all 7 countries, with fluctuation in utilization for both drugs. Orlistat showed a statistically significant increase only in Norway (2007-2009, APC=37.74, $p < 0.05$), while the most extreme decrease was seen in Serbia and Estonia (2019-2022: APC= -59,49, $p < 0.05$; 2010-2012: APC=-54.95, $p < 0.05$, respectively). It is interesting that in Norway a period of increase of more than 30% was followed by a similar decrease in orlistat utilization.

Semaglutide is the only drug having a statistically significant increase in utilization in all countries (except Croatia), while setmelanotide is the only drug (of all analyzed) having no utilization in the selected countries. We represent the joinpoint regression analysis model results in Table I, and graphically in Figures 1-6.

In the Table III, we provide utilization data from seven countries (Croatia, Estonia, Finland, Latvia, Lithuania, Norway, and Serbia) that we used in our analysis.

Table I Joinpoint regression analysis models

Tabela I Modeli *joinpoint* regresione analize

ATC classification	**A: Alimentary tract and metabolism**		**A08AA10: sibutramine**		**A08AA62: naltrexone, bupropion**		**A08AB01: orlistat**		**A10BJ02: liraglutide****		**A10BJ06: semaglutide****	
Country	*Period*	*APC*	*Period*	*APC*	*Period*	*APC*	*Period*	*APC*	*Period*	*APC*	*Period*	*APC*
Croatia	2017-2011 2011-2014 2014-2022	10.73* 1.93 9.86*	2007-2011	-55.78	-	-	2007-2010 2010-2013 2013-2022	11.30 -35.34* -3.87	2014-2016 2016-2022	290.29* -11.56	2019-2022	-30.20
Estonia	2010-2016 2016-2022	11.15* 2.56*	-	-	2017-2022	-18.39	2010-2012 2012-2019 2019-2022	-57.95* -18.15* -0.53	2012-2017 2017-2022	49.18* -22.79*	2019-2022	129.03*
Finland	2018-2021	2.90*	-	-	-	-	2018-2021	-8.49*	2018-2021	-10.50	2019-2021	277.00*
Latvia	2010-2017 2017-2020 2020-2022	2.04 46.83 3.83	-	-	-	-	2010-2014 2014-2022	-13.11* -2.11	2010-2018 2018-2022	51.43* -37.83*	2019-2022	92.19*
Lithuania	2010-2014 2014-2018	0.20 7.85	-	-	-	-	2010-2012 2012-2018	-41.18 17.62	2014-2017	-9.82	-	-
Norway	2007-2010 2010-2013 2013-2022	-0.85 -8.18 4.51*	2007-2011	-30.48	2017-2022	108.13*	2007-2009 2009-2012 2012-2022	37.74* -33.71* -7.93*	2010-2016 2016-2018	4.32 100.60*	2019-2022	170.40*
Serbia	2007-2010 2010-2022	-6.47 9.17*	2007-2011	126.16*	2020-2022	134.52*	2007-2015 2015-2019 2019-2021	-12.93* 12.96 -59.49*	2015-2022	67.55	2021-2022	2056.25

ATC - Anatomical Therapeutic Chemical; APC - Annual Percent Change; *APC is significantly different from zero at alpha = 0.05; **including utilization data also for diabetes mellitus type 2 indication

ATC – anatomsko-terapijsko-hemijska; APC – godišnja procentualna promena; *APC značajno različit od nula do alfa = 0.05; ** uključujući podatke o potrošnji takođe i za indikaciju dijabetes melitus tip 2

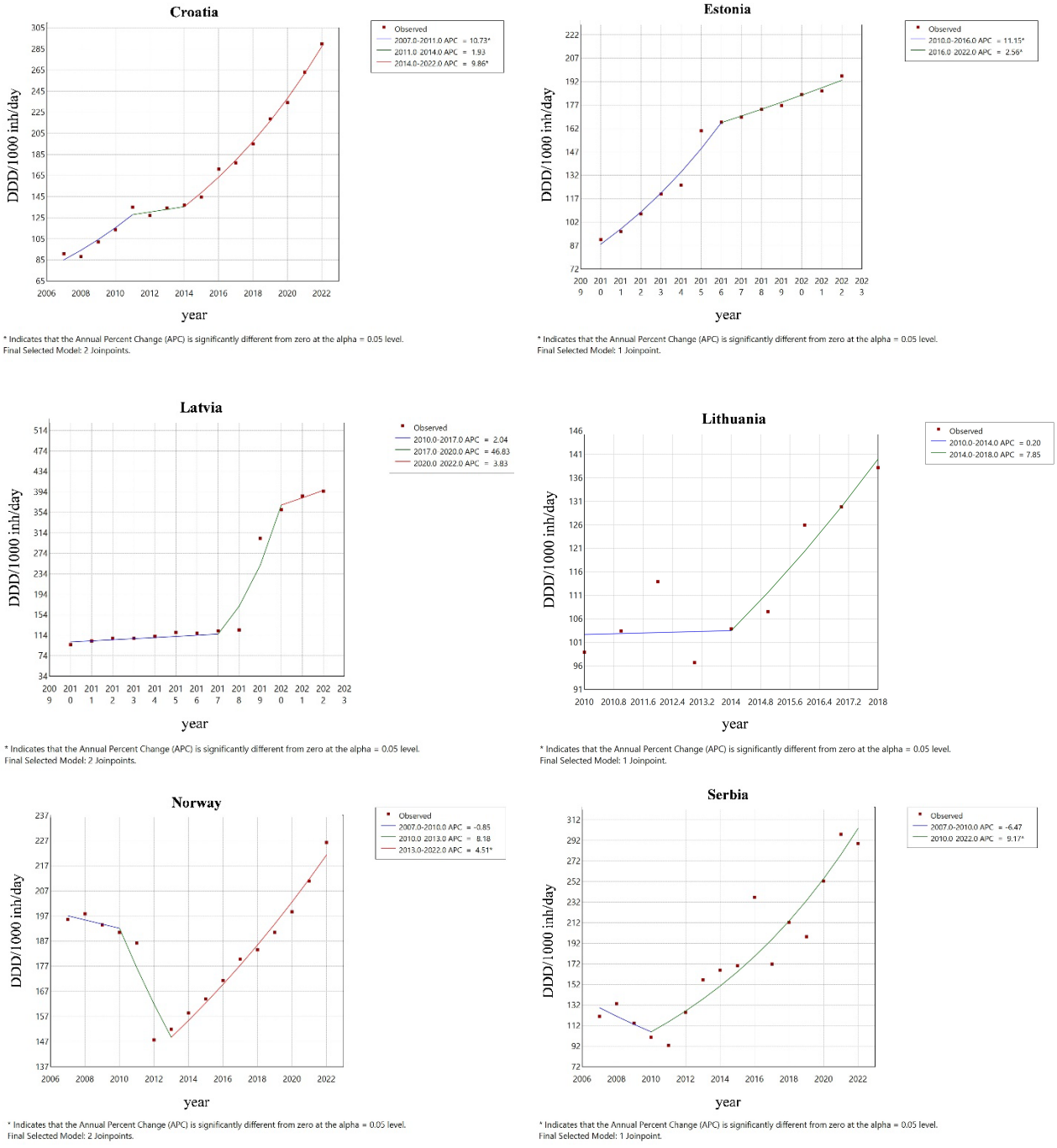


Figure 1. Trend analysis of drug consumption on the 1st ATC level: Alimentary tract and metabolism

Slika 1. Analiza trenda potrošnje lekova na 1. nivou ATC: Alimentarni trakt i metabolizam

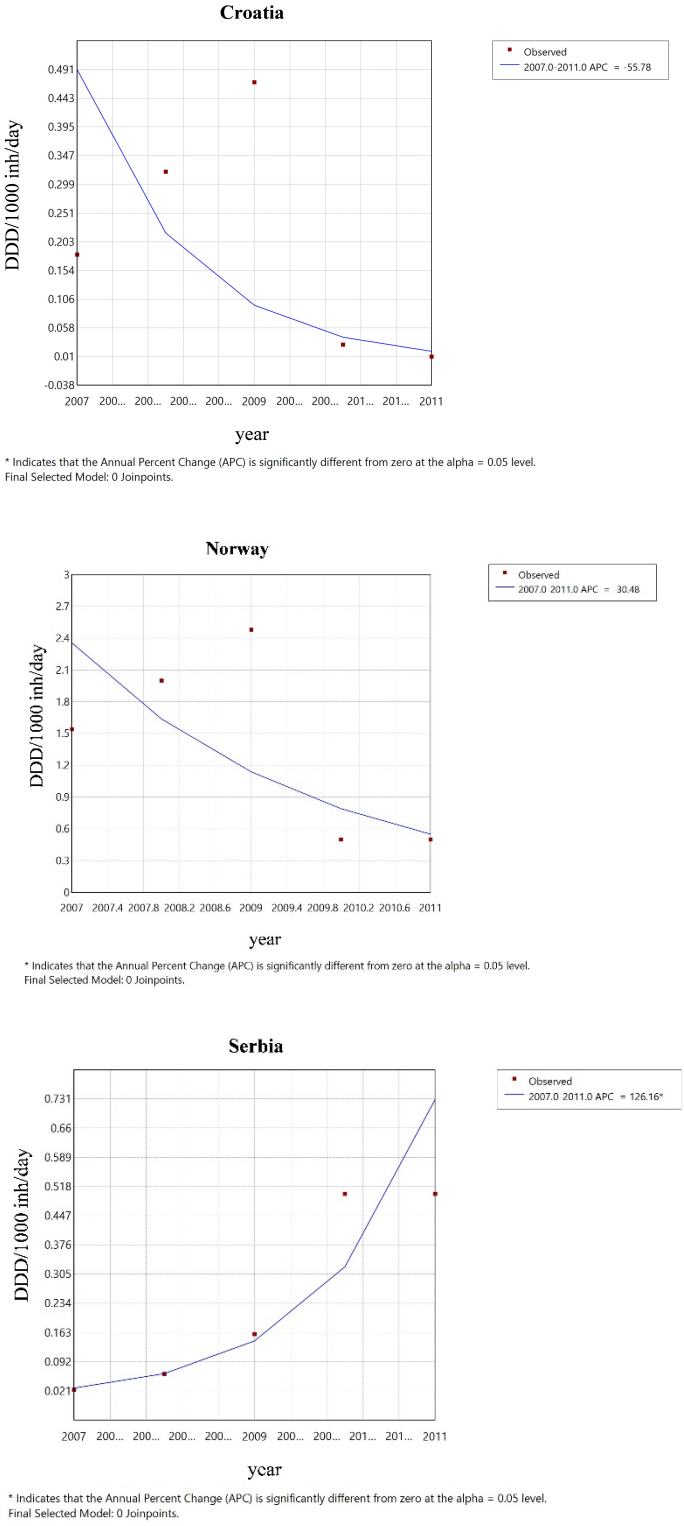


Figure 2. Trend analysis of drug consumption on the 5th ATC level: sibutramine (A08AA10)

Slika 2. Analiza trenda potrošnje lekova na 5. nivou ATC: sibutramin (A08AA10)

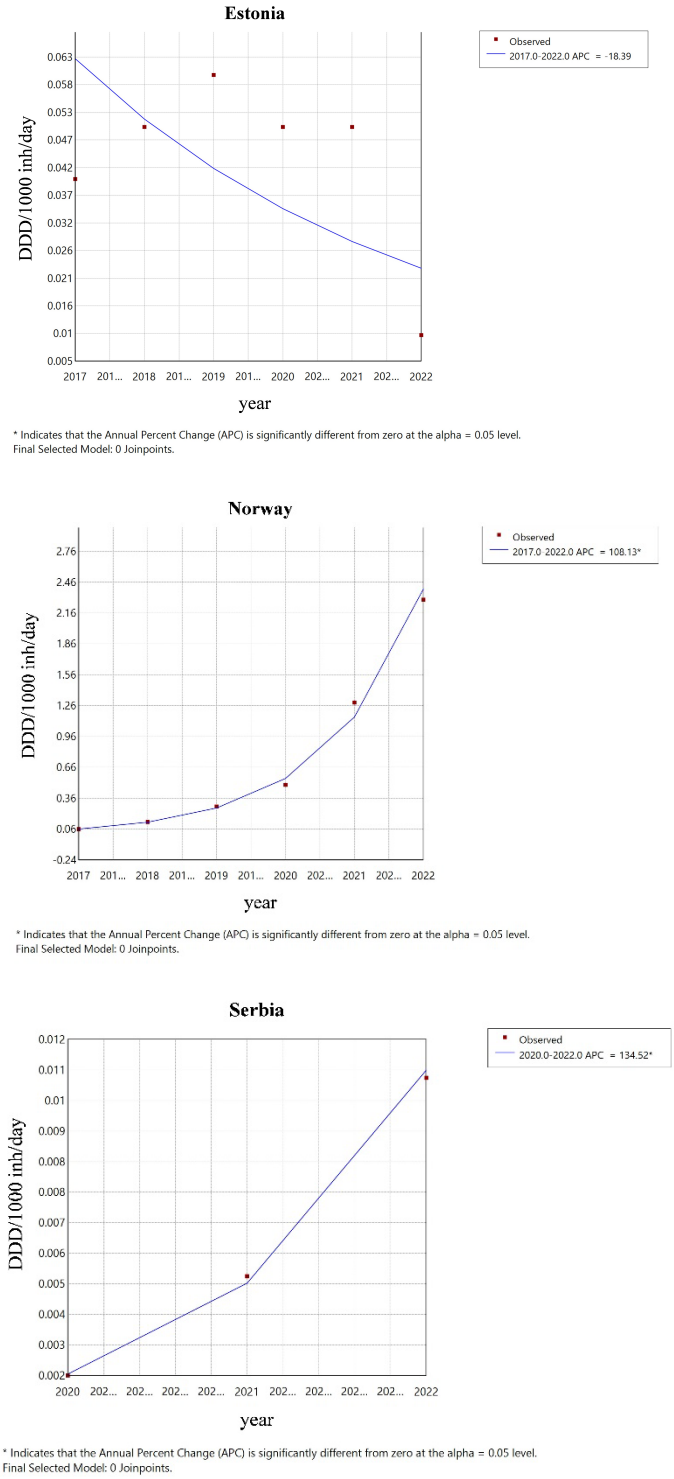


Figure 3. Trend analysis of drug consumption on the 5th ATC level: bupropion and naltrexone (A08AA62)

Slika 3. Analiza trenda potrošnje lekova na 5. nivou ATC: bupropion i naltrekson (A08AA62)

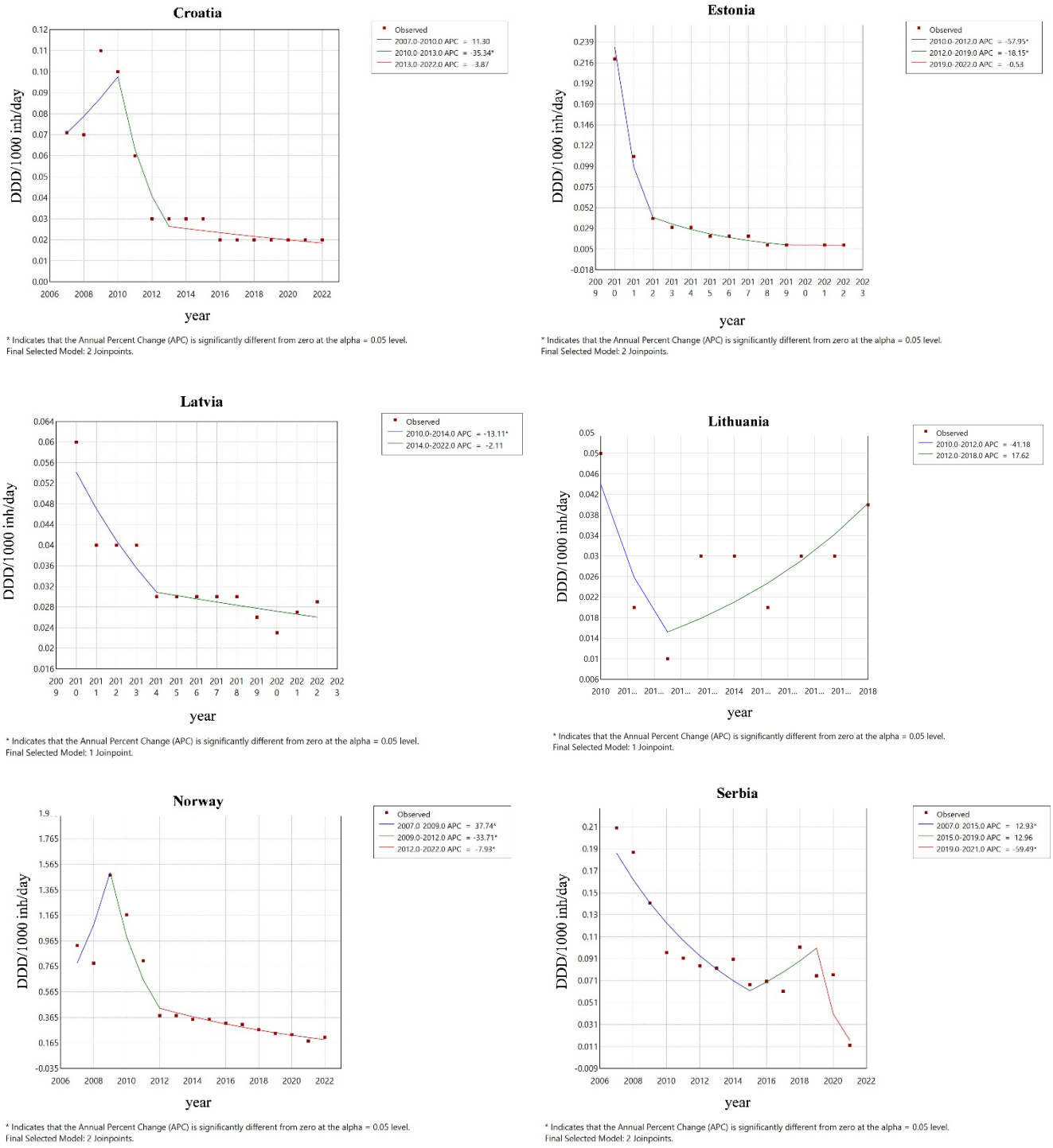
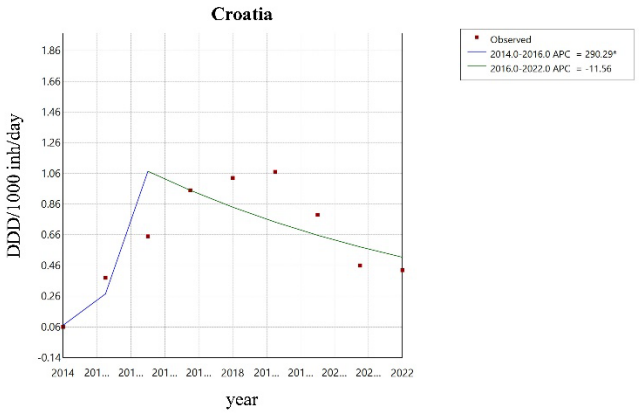
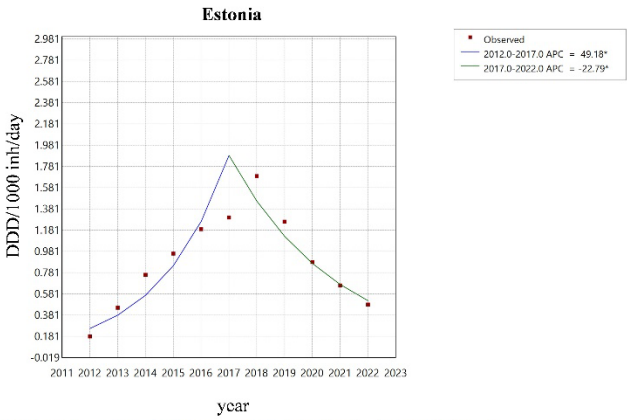


Figure 4. Trend analysis of drug consumption on the 5th ATC level: orlistat (A08AB01)

Slika 4. Analiza trenda potrošnje lekova na 5. nivou ATC: orlistat (A08AB01)



* Indicates that the Annual Percent Change (APC) is significantly different from zero at the alpha = 0.05 level.
Final Selected Model: 1 Joinpoint.



* Indicates that the Annual Percent Change (APC) is significantly different from zero at the alpha = 0.05 level.
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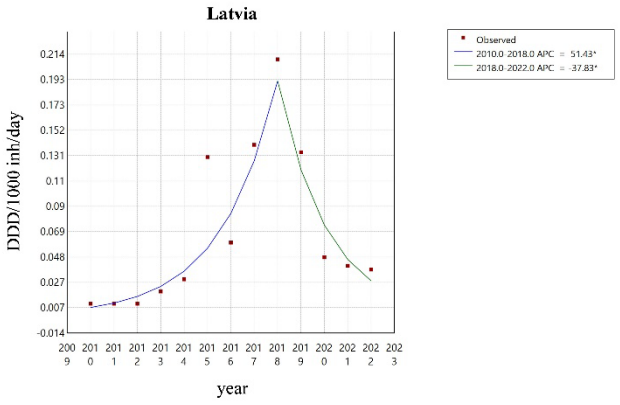

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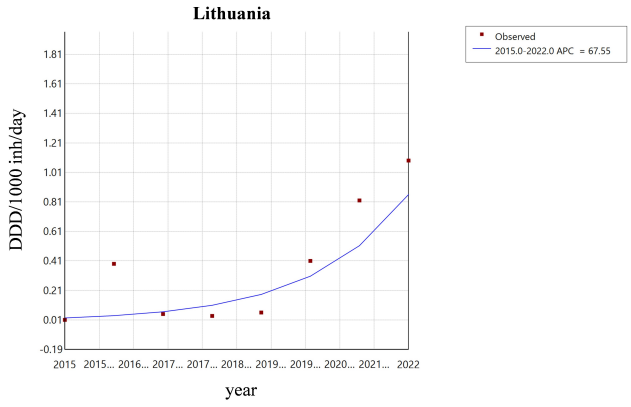
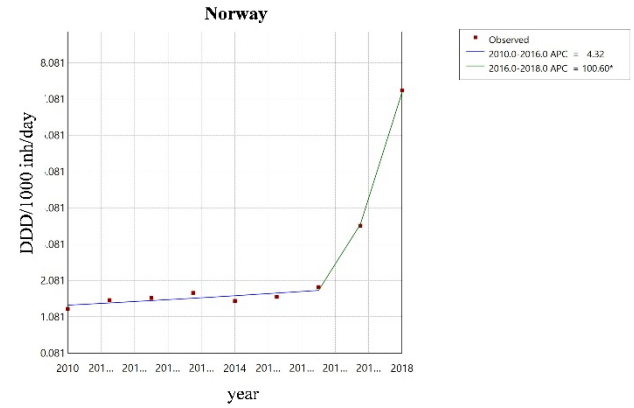


* Indicates that the Annual Percent Change (APC) is significantly different from zero at the alpha = 0.05 level.
Final Selected Model: 0 Joinpoints.



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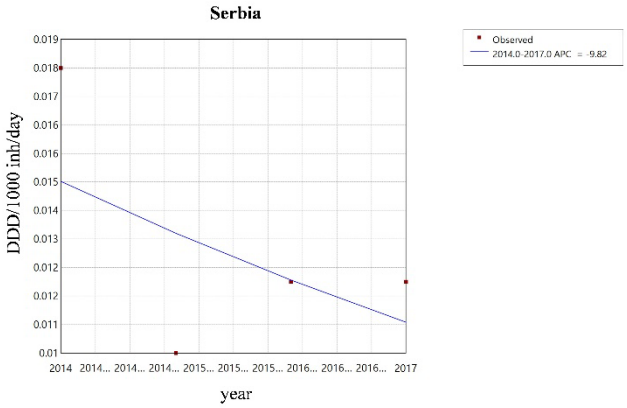
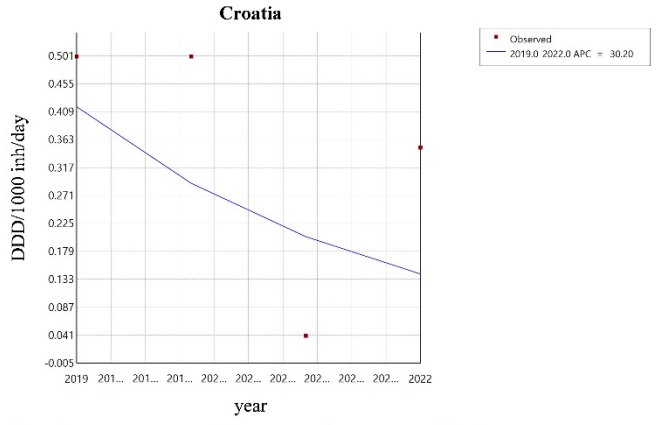
Final Selected Model: 1 Joinpoint.



* Indicates that the Annual Percent Change (APC) is significantly different from zero at the alpha = 0.05 level.
Final Selected Model: 0 Joinpoints.

Figure 5. Trend analysis of drug consumption on the 5th ATC level: liraglutide (A10BJ02)

Slika 5. Analiza trenda potrošnje lekova na 5. nivou ATC: liraglutid (A10BJ02)



* Indicates that the Annual Percent Change (APC) is significantly different from zero at the alpha = 0.05 level.
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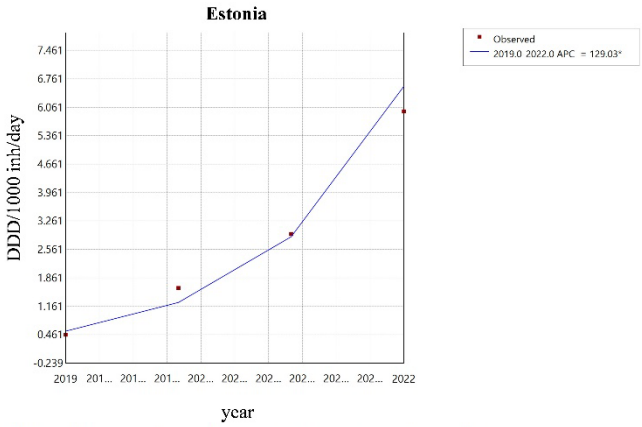

* Indicates that the Annual Percent Change (APC) is significantly different from zero at the alpha = 0.05 level.
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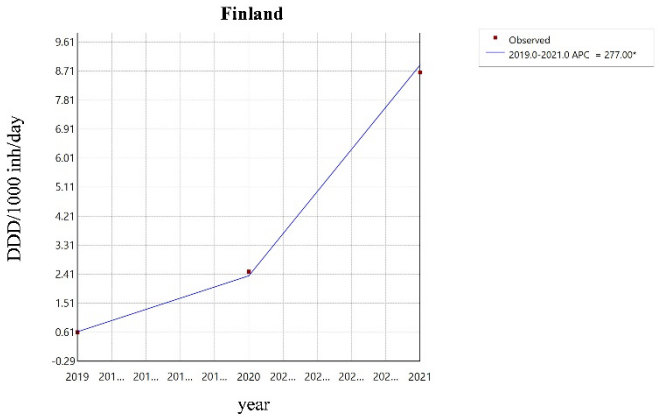

* Indicates that the Annual Percent Change (APC) is significantly different from zero at the alpha = 0.05 level.
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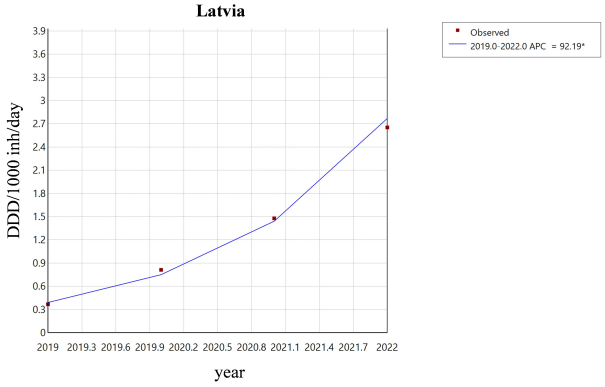

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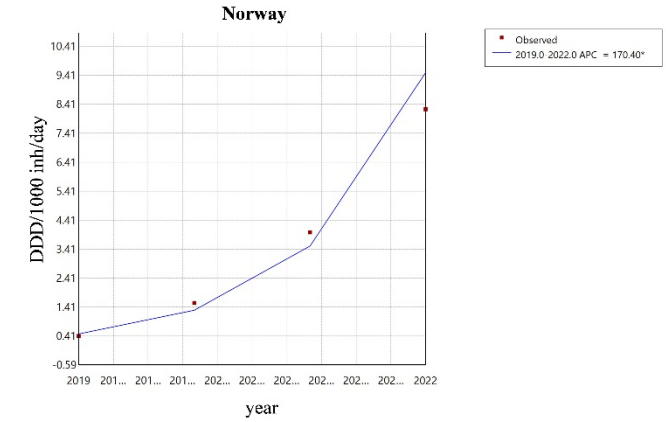

* Indicates that the Annual Percent Change (APC) is significantly different from zero at the alpha = 0.05 level.
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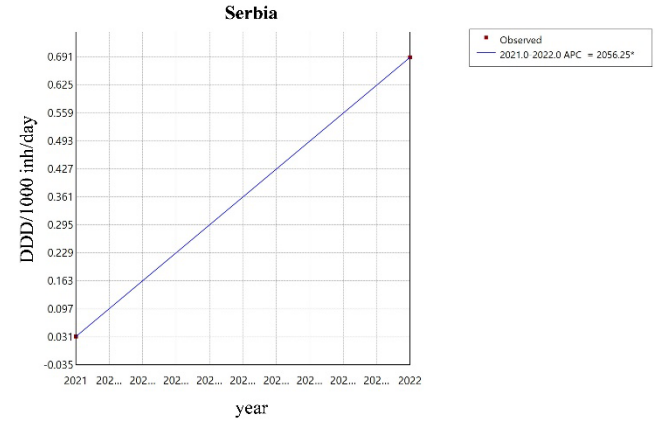

* Indicates that the Annual Percent Change (APC) is significantly different from zero at the alpha = 0.05 level.
Final Selected Model: 0 Joinpoints.

Figure 6. Trend analysis of drug consumption on the 5th ATC level: semaglutide (A10BJ06)

Slika 6. Analiza trenda potrošnje lekova na 5. nivou ATC: semaglutid (A10BJ06)

Reimbursement lists status

We analyzed the reimbursement status of antiobesity drugs authorized by the EMA in 22 European countries. In only 36% of countries (8/22), the health insurance fund (HIF) reimburses at least one antiobesity drug. In Croatia, only orlistat (Xenical) is reimbursed, while in Ireland only liraglutide (Saxenda) is reimbursed. Semaglutide (Wegovy) is reimbursed only in Denmark and Switzerland.

The HIF covers liraglutide (Saxenda) and naltrexone/bupropion in Denmark, Finland, the Netherlands, and Slovenia. Setmelanotide is only reimbursed in the Netherlands, where the retail price of this drug is 2,997.50 EUR.

In Slovenia, four out of six analyzed drugs are reimbursed, except setmelanotide and semaglutide (Wegovy), even though semaglutide indicated for DMT2 (Ozempic, Rybelsus) is reimbursed. In Serbia, only novel antiobesity drugs are authorized by the National Medical Agency but not covered by health insurance.

Table II summarizes all the results indicating European countries where antiobesity drugs costs are covered by the HIF.

Table II Reimbursement status on drug lists of antiobesity drugs in Europe

Tabela II Status refundacije na listama lekova za lekove protiv gojaznosti u Evropi

Brand name:	**Alli**	**Wegovy**	**Saxenda**	**Mysimba**	**Xenical**	**Imcivree**
INN:	**orlistat**	**semaglutide**	**liraglutide**	**naltrexone, bupropion**	**orlistat**	**setmelanotide**
Country	**reimbursement status**					
Belgium	no	no	no	no	no	no
Bulgaria	no	no	no	no	no	no
Croatia	no	no	no	no	yes	no
Czech Republic	no	no	no	no	no	no
Denmark	no*	yes	yes	yes	no*	no
Estonia	no	no	no	no	no	no
Finland	no	no	yes	yes	no	no
France	no	no	no	no	no	no
Ireland	no	no	yes	no	no	no
Italy	no	no	no	no	no	no
Latvia	no	no	no	no	no	no
Lithuania	no	no	no	no	no	no
Montenegro	no**	no**	no**	no**	no**	no**
Netherlands	no	no	yes	yes	no	yes
Norway	no	no	no	no	no	no
Poland	no	no	no	no	no	no
Portugal	no	no	no	no	no	no
Serbia	no**	no	no	no	no**	no**
Slovakia	no	no	no	no	no	no
Slovenia	yes	no	yes	yes	yes	no
Sweden	no	no	no	no	yes	no
Switzerland	no	yes	yes	no	yes	no

*orlistat available under other brand (trade) names
** drugs do not have marketing authorization

* orlistat dostupan pod drugim zaštićenim nazivom
** lekovi nemaju dozvolu za lek

Table III Utilization data

Tabela III Podaci o potrošnji

A: ALIMENTARY TRACT AND METABOLISM							
YEAR	**Croatia**	**Estonia**	**Finland**	**Latvia**	**Lithuania**	**Norway**	**Serbia**
2007	90.779	-	-	-	-	195.600	121.060
2008	88.330	-	-	-	-	197.870	133.280
2009	102.030	-	-	-	-	193.460	114.380
2010	113.690	90.930	-	95.840	98.910	190.520	100.620
2011	135.140	96.060	-	102.910	103.430	186.200	92.700
2012	127.180	107.310	-	107.810	113.930	147.730	124.838
2013	134.080	120.040	-	108.110	96.710	151.880	156.372
2014	137.050	125.810	-	111.810	103.870	158.350	165.878
2015	144.570	160.530	-	119.390	107.550	163.960	170.220
2016	171.060	166.050	-	117.830	125.950	171.330	236.744
2017	177.150	169.320	-	122.500	129.830	179.850	171.910
2018	195.060	174.280	296.680	124.380	138.170	183.550	212.240
2019	218.730	176.800	304.160	303.147	-	190.520	198.420
2020	234.330	183.840	314.380	359.241	-	198.710	252.660
2021	263.040	186.030	322.790	385.920	-	210.920	297.960
2022	289.790	195.720	-	395.262	-	226.270	289.010
A08: ANTIOBESITY PREPARATIONS, EXCL. DIET PRODUCTS							
YEAR	**Croatia**	**Estonia**	**Finland**	**Latvia**	**Lithuania**	**Norway**	**Serbia**
2007	0.252	-	-	-	-	2.760	0.233
2008	0.390	-	-	-	-	2.990	0.249
2009	0.580	-	-	-	-	3.960	0.300
2010	0.130	0.220	-	0.170	0.090	1.170	0.096
2011	0.070	0.110	-	0.190	0.110	0.810	0.091
2012	0.040	0.040	-	0.220	0.150	0.380	0.084
2013	0.030	0.030	-	0.260	0.160	0.380	0.082
2014	0.030	0.030	-	0.300	0.150	0.350	0.090
2015	0.030	0.020	-	0.320	0.170	0.350	0.067
2016	0.030	0.020	-	0.030	0.030	0.320	0.070
2017	0.020	0.050	-	0.040	0.030	0.370	0.061

2018	0.020	0.060	0.090	0.040	0.040	0.400	0.101
2019	0.020	0.060	0.080	0.026		0.520	0.075
2020	0.020	0.050	0.070	0.023		0.710	0.078
2021	0.020	0.050	0.070	0.027		1.480	0.017
2022	0.020	<0.01		0.029		2.500	0.011
A08AA10: SIBUTRAMIN							
YEAR	**Croatia**	**Estonia**	**Finland**	**Latvia**	**Lithuania**	**Norway**	**Serbia**
2007	0.181	-	-	-	-	1.540	0.024
2008	0.320	-	-	-	-	2.000	0.062
2009	0.470	-	-	-	-	2.480	0.159
2010	0.030	0.010	-	0.020	0.030	-	0.000
2011	0.010	-	-	0.010	-	-	0.000
A08AA62: BUPROPION, NALTREXON							
2017	-	0.040	-	0.010	-	0.060	-
2018	0.000	0.050	-	0.010	-	0.130	-
2019	0.000	0.060	-	-	-	0.280	-
2020	0.000	0.050	-	-	-	0.490	0.002
2021	0.000	0.050	-	-	-	1.290	0.005
2022	0.000	<0.01	-	-	-	2.290	0.011
A08AB01: ORLISTAT							
YEAR	**Croatia**	**Estonia**	**Finland**	**Latvia**	**Lithuania**	**Norway**	**Serbia**
2007	0.071	-	-	-	-	0.930	0.209
2008	0.070	-	-	-	-	0.790	0.187
2009	0.110	-	-	-	-	1.480	0.141
2010	0.100	0.220	-	0.060	0.050	1.170	0.096
2011	0.060	0.110	-	0.040	0.020	0.810	0.091
2012	0.030	0.040	-	0.040	0.010	0.380	0.084
2013	0.030	0.030	-	0.040	0.030	0.380	0.082
2014	0.030	0.030	-	0.030	0.030	0.350	0.090
2015	0.030	0.020	-	0.030	0.020	0.350	0.067
2016	0.020	0.020	-	0.030	0.030	0.320	0.070
2017	0.020	0.020	-	0.030	0.030	0.310	0.061
2018	0.020	0.010	0.090	0.030	0.040	0.270	0.101
2019	0.020	<0.01	0.080	0.026		0.240	0.075

2020	0.020	<0.01	0.070	0.023		0.230	0.076
2021	0.020	-	0.070	0.027		0.180	0.012
2022	0.020	<0.01	-	0.029		0.210	0.000
A10BJ02: LIRAGLUTIDE							
YEAR	**Croatia**	**Estonia**	**Finland**	**Latvia**	**Lithuania**	**Norway**	**Serbia**
2010	-	-	-	0.010	-	0.060	-
2011	-	-	-	0.010	-	0.410	-
2012	-	0.180	-	0.010	-	0.820	-
2013	-	0.450	-	0.020	-	1.090	-
2014	0.060	0.760	-	0.030	-	1.300	-
2015	0.380	0.960	-	0.130	0.010	1.540	-
2016	0.650	1.190	-	0.060	0.390	1.600	-
2017	0.950	1.300	-	0.140	0.050	1.740	0.013
2018	1.030	1.690	1.920	0.210	0.037	1.520	0.018
2019	1.070	1.260	2.080	0.134	no data	1.630	0.010
2020	0.790	0.880	1.770	0.048	no data	1.900	0.012
2021	0.460	0.660	1.400	0.041	no data	3.590	0.012
2022	0.430	0.480	-	0.038	no data	7.320	0.060
A10BJ06: SEMAGLUTIDE							
YEAR	**Croatia**	**Estonia**	**Finland**	**Latvia**	**Lithuania**	**Norway**	**Serbia**
2018	-	-	-	-	no data	0.000	-
2019	0.000	0.460	0.610	0.367	no data	0.410	-
2020	0.000	1.610	2.490	0.812	no data	1.550	-
2021	0.040	2.940	8.670	1.478	no data	3.990	0.032
2022	0.350	5.960	-	2.653	no data	8.240	0.690

Discussion

Sibutramine was the drug authorized in Europe in 2001, followed by serious cardiovascular adverse effects reporting (including death), which caused its withdrawal from the European market in 2010 (59).

Since naltrexone/bupropion is a novel antiobesity drug that has been authorized in Europe for less than 10 years, an increasing trend in its utilization is expected in most countries, as demonstrated by our results (60). On the other hand, orlistat has been used in practice for about 25 years (authorized by the EMA in 1998) (61), being almost the

only drug indicated for obesity for decades, and a decreasing trend in its utilization may be caused by the increased utilization of novel drugs.

Novel drugs (liraglutide, semaglutide, naltrexone/bupropion) showed an upward trend in utilization from 2019 in almost all the selected countries.

Even though many pharmacoeconomic studies showed the cost-effectiveness of novel drugs compared to different approaches (e.g., diet and exercise, no treatment…) (62-65), in most European countries, antiobesity drugs are still not reimbursed by health insurance funds, meaning patients must pay for them out of pocket. The "best situation" is that in Slovenia and Denmark, where almost all drugs are reimbursed, while in almost 70% of European countries no obesity drug is covered by the HIF.

The safety of antiobesity drugs was a concern in the past, and many of them were withdrawn from the market, e.g.: dexfenfluramine and fenfluramine due to cardiac valvulopathy; rimonabant due to an increased risk of depression and suicidal ideation, and sibutramine as mentioned before; lorcaserin was removed due to cancer (66-68). The effectiveness of antiobesity drugs was a barrier as well, since, in clinical practice, antiobesity drugs were prescribed to prevent or improve related chronic diseases (hypertension, DMT2, cardiovascular risk, etc.) (66-68).

Our results showed no unique utilization trends in any of the selected European countries. Some drugs showed an increase in utilization in one country but a decrease in another; in one country, there was first a trend of increase and then a decrease in utilization. According to the available publications, the reason for low utilization of antiobesity drugs may lie in low patient adherence, physicians not feeling comfortable prescribing them due to safety and efficacy, lack of knowledge of the availability of novel drugs, having limited experience with these drugs, or not recognizing that drugs should be used in obesity management (66-67). Moreover, most of these drugs are not reimbursed by the HIF, or if they are, they have additional prescribing limitations, bearing high drug costs for the patients (66-68). Increased utilization of novel drugs (e.g. naltrexone/bupropion and liraglutide) may be influenced by the increased awareness of obesity as a chronic, relapsing disease in the last years, emphasizing its economic impact worldwide (7-8). To the best of the authors' knowledge, this is the first study focused on utilization and reimbursement status for antiobesity drugs, including novel drugs, in European countries.

The main limitations of this study are that utilization is analyzed only in the European countries where data are publicly available; data levels (pharmacy, wholesaler) are not the same between countries, so direct DDD/1000inhabitans/day utilization comparison is not possible, and only trend analysis is. In addition, the data for semaglutide and liraglutide include utilization for both indications, obesity and DMT2, so it was not possible to make a distinction between the two and determine which indication influences utilization the most.

Our utilization trend analysis results show fluctuation for almost all antiobesity drugs, which may be caused by the fact that, in the majority of European countries, they

are paid by the patient. Considering that obesity poses significant health and economic risks to almost every country worldwide, it is crucial to introduce and implement global and local policies, along with new reimbursement scheme models.

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Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Author contributions

IS – conceptualization, data curation, formal analysis, investigation, methodology; visualization, writing - original draft and review & editing; MV, BK - data curation, formal analysis, investigation, methodology, writing - original draft and review & editing; BR, DK, AMG - data curation, writing - original draft and review & editing; SMJ – conceptualization, data curation, formal analysis, investigation, methodology, supervision, visualization, writing - original draft and review & editing; DL, MO – conceptualization, investigation, methodology, supervision, writing - original draft and review & editing;

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Analiza trenda potrošnje lekova protiv gojaznosti i statusa na listama lekova koji se refundiraju – perspektiva odabranih evropskih zemalja

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Kratak sadržaj

Gojaznost je hronična, kompleksna bolest koja se ponovo javlja (relaps) i utiče na zdravstvene sisteme i ekonomiju širom sveta. Cilj nam je da analiziramo trendove potrošnje lekova protiv gojaznosti, kao i status refundacije tih lekova na listama lekova fondova zdravstvenog osiguranja (FZO) u odabranim evropskim zemljama. Za analizu trenda potrošnje korišćena je metodologija DDD/1000 stanovnika/dan, gde su korišćeni podaci iz zvaničnih nacionalnih izveštaja o potrošnji. Za analizu statusa refundacije za 5 lekova protiv gojaznosti (orlistat, semaglutid, liraglutid, naltrekson/bupropion, setmelanotid), pregledani su sajtovi nacionalnih FZO u 22 evropske zemlje. Analiza trenda je otkrila fluktuacije za skoro sve lekove protiv gojaznosti (najveći pad zabeležen za orlistat u Srbiji, a najveći porast za liraglutid u Hrvatskoj). Novi lekovi protiv gojaznosti pokazuju trend rasta upotrebe u skoro svim zemljama. U dve od tri evropske zemlje lekove protiv gojaznosti ne pokriva FZO. Slovenija i Danska refundiraju troškove većine lekova protiv gojaznosti. Holandija je jedina zemlja u kojoj trošak setmelanotida plaća FZO. Naši rezultati naglašavaju važnost davanja prioriteta uvođenju i implementaciji novih strategija i modela šema refundacije u globalnim i nacionalnim politikama usmerenim protiv gojaznosti.

Ključne reči: gojaznost, potrošnja lekova, DDD/1000 stanovnika/dan, fond za zdravstveno osiguranje, status refundacije