



# Calculation of Purchasing Power Parities for Medicinal Products via EURIPID database

(see Doc 21/P1/11)

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**Claudia Habl, General Secretary of Euripid's Board of Participants**  
supported by **Martin Zuba, Austrian National Public Health Institute (GÖ FP)** and  
**Gergely Néméth, National Health Insurance Fund of Hungary (NEAK)**

Meeting of the Eurostat PPP Working Group, 18 Nov. 2021

Agenda Item 4.5.



# WHO WE ARE

# WHAT WE DO

## THE DATABASE

A comprehensive, continuously maintained, easy-to-use online database of prices of reimbursed pharmaceutical products; it is a resource tool for national competent authorities of its participating countries and the services of the European Commission.

## THE COLLABORATION



Austria



Belgium



Bulgaria



Cyprus



Czech Republic



Denmark



Estonia



Finland



France



Greece



Hungary



Israel



Italy



Ireland



Latvia



Lithuania



Netherlands



Norway



Poland



Portugal



Slovakia



Slovenia



Spain



Sweden



Switzerland



United Kingdom

## OUR AIM

## OUR OBJECTIVES

- To investigate the possibility of using the EURIPID database as a data source for the calculation of Purchasing Power Parities (PPPs) for pharmaceutical products, including analysing all advantages and disadvantages compared to the existing methodology, as well as making test PPP calculations using different models.
- To support Eurostat in developing top seller lists of pharmaceutical products for the PPP exercise.
- To calculate average prices and PPPs of pharmaceutical products for 2018, 2019 and 2020 and PPPs using sales volumes as weights.
- To compare our results with those of the Eurostat survey for a set of pharmaceutical products (E20-2 Consumer Good Survey, in short: CGS)



**Baseline**

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**Methodology**

# AVAILABLE PRICE TYPES FOR 28 COUNTRIES

Country	Available price types in EURIPID for PPP calculation			
	per September 2021			
	Manufacturer Price	Wholesale Price	Net Retail Price	Gross Retail Price
1 Austria	delivered	delivered	delivered*	delivered*
2 Belgium	delivered	calculated	calculated	delivered
3 Bulgaria	delivered	delivered	delivered	Delivered
4 Croatia	approx.	delivered	approximated	approximated
5 Cyprus	n. a.	delivered	delivered	delivered
6 Czech Republic	delivered	n.a.	calculated	delivered
7 Denmark	approx.	delivered	calculated	delivered
8 Estonia	calculated	calculated	calculated	delivered
9 Finland	approx.	delivered	delivered	delivered
10 France	delivered	n.a.	calculated	delivered
11 Greece	delivered	delivered	calculated	delivered
12 Hungary	delivered	delivered	delivered	delivered
13 Iceland	approx.	delivered	calculated	delivered
14 Ireland	n. a.	delivered	approximated	approximated
15 Israel	n. a.	delivered	delivered	delivered
16 Italy	delivered	n. a.	calculated	delivered
17 Latvia	calculated	delivered	delivered	delivered
18 Lithuania	delivered	calculated	calculated	delivered
19 Netherlands	approx.	delivered	approximated	approximated
20 Norway	approx.	delivered	calculated	delivered
21 Poland	delivered	delivered	partly calculated	partly delivered
22 Portugal	n. a.	n. a.	calculated	delivered
23 Slovakia	delivered	delivered	delivered	delivered
24 Slovenia	calculated	delivered	approx.	approximated
25 Spain	delivered	n. a.	calculated	delivered
26 Sweden	approx.	delivered	delivered	delivered
27 Switzerland	delivered	n. a.	calculated	delivered
28 United Kingdom	n. a.	approx.	delivered**	delivered**

# Virtual products

Compare prices of products defined

by

- ATC
- INN & strength
- dosage form group
- pack size group

Inclusion and exclusion criteria

→ temporal & geographic availability

- priced in at least 6 countries
- available for 365/366 days

# Unit Price

Day-weighted average

gross retail price / pack size

**(aka consumer price)**

- of all quotations within virtual product

# Expenditure weights

Volume information for

11 countries Austria, Belgium, Czech Republic, Estonia, Hungary, Italy, Latvia, Norway, Poland, Slovakia and Sweden.

# Virtual products

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Pack size groups are defined to cluster small, medium, monthly and larger packs as the size of the container resp. number of single doses/tabs/shots/hubs etc. has impact on the price of a pharmaceutical product. Four groups will be used: 1-10 units, 10-21 units; 21-50 units and 51 and more units.

## Dosage form groups:

Around 434 different dosage forms with 18 different routes of administration (reaching from auricular to vaginal) included in the database.

To increase the comparability of products dosage forms are merged into 112 groups (e.g., oral form, solid)

# Approximation of missing Consumer Prices

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**Croatia:** For the period of 1/1/2017 to 10/2/2021: adding HRK 6.64 per package to the wholesale price in the Euripid database plus a 5.0 percent VAT rate.

**Ireland:** The so-called Health Service Executive price is very much like the British NHS-price or trade price which is considered as Retail or Consumer Price in Euripid. Therefore, we added no average pharmacy mark-up but only the appropriate VAT rate of 0/ 13.5/23 resp. 21 percent to the wholesale price in the Euripid database.

**Netherlands:** We added an average pharmacy mark-up of 7 Euros per package to the wholesale price in the Euripid database plus 9% VAT.

**Slovenia:**We added an average pharmacy mark-up of 1,06785 EUR per package to the wholesale price in the Euripid database plus 9.5 % VAT.



# PRICES OF VIRTUAL PRODUCTS

## Prices of virtual products are computed as follows:

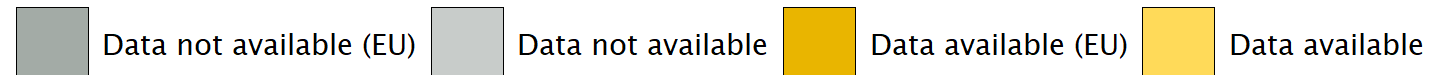
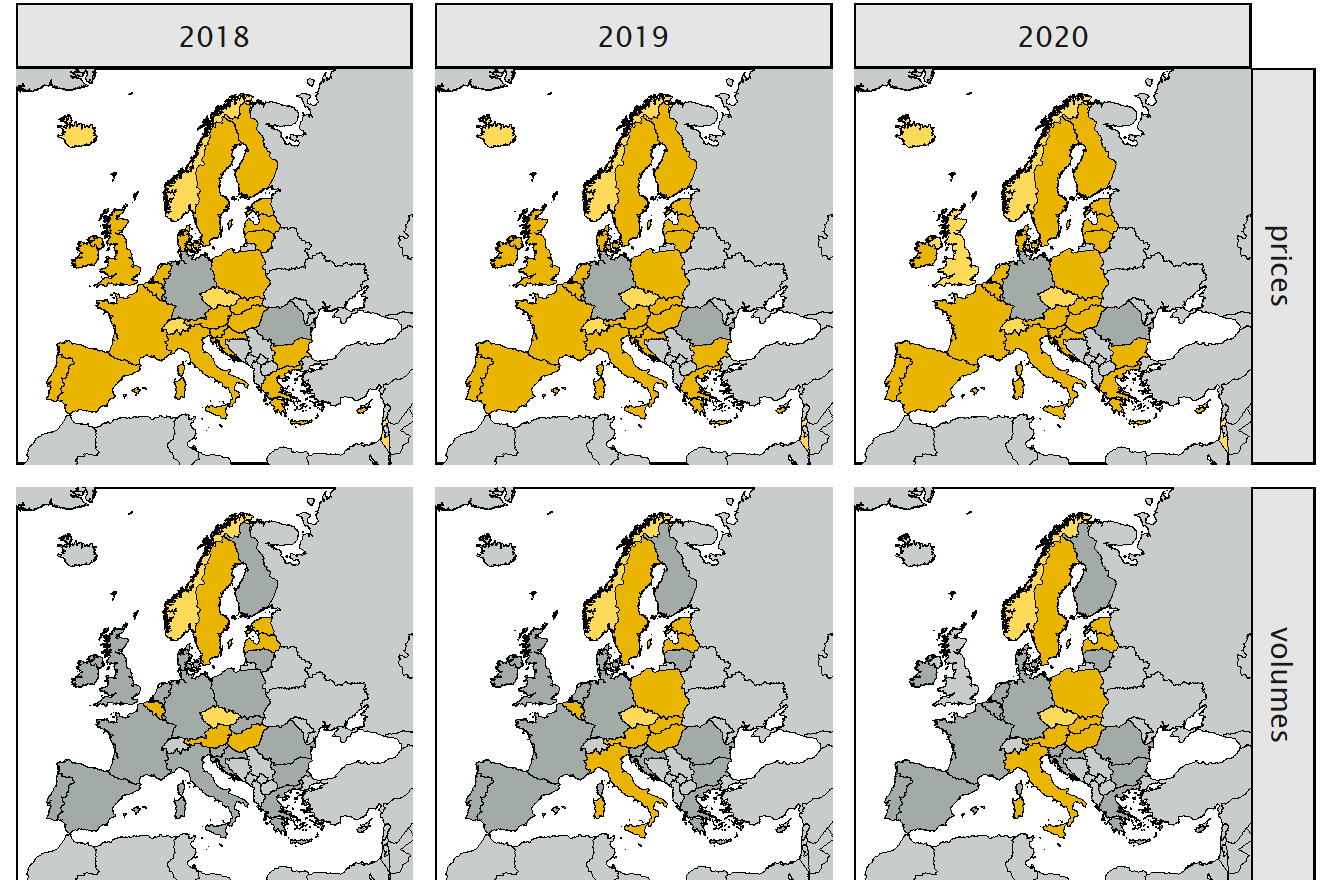
1. Calculation of day-weighted average monthly prices (concrete products)
2. Calculation of average annual prices as arithmetic mean of monthly prices (concrete products)
3. Calculation of average annual **unit prices** via division by package size (concrete products)
4. Calculation of average annual prices of virtual products as unweighted arithmetic means of all products within the same virtual product (**virtual products**)

# Data Extraction

- Data was extracted at 24 September 2021 for the years 2018–2020.
- 20 data fields, see next slide.
- In total 223,677 data rows  
→ filtering to virtual products prices available in 6 countries reduced data set to 156,325 rows.

## Data availability in Euripid

September 2021



data field	Description	type	distinct values	from	to
Country		character	28	Austria	United Kingdom
Year		numeric	3	2018	2020
ATC		character	2846	A01AA01	V10XX04
route_of_administration	grouped	character	18	auricular	vaginal
inn_str	INN & strength	character	10383	10x [clotrimazole 10 mg/g] + 1x [clotrimazole 500 mg]	zuclopenthixol 500 mg
dosage_form_group	grouped	character	112	bath additive	vaginal, solid form
packsize_group	grouped	character	4	1-10	51<
nr_products	Number of priced products	numeric	76	1	270
avg_unit_price.NCU	arithmetic mean of all unit prices, in national currency units	numeric	137687	0.00167	14535286
avg_unit_price.EUR	arithmetic mean of all unit prices, in Euro	numeric	161989	0.001891	440922.8
price_sd	standard deviation of prices	numeric	59410	0	901686.2
units_sold	units sold; 0 if data unavailable	numeric	41455	0	1967366200
price_volume.NCU	price x volume, in national currency units	numeric	50517	0	18722053728
price_volume.EUR	price x volume, in Euro	numeric	48881	0	6808290379
vol_avg_unit_price.NCU	volume-weighted arithmetic mean of all unit prices, in national currency units	numeric	37359	0	2363890
vol_avg_unit_price.EUR	volume-weighted arithmetic mean of all unit prices, in Euro	numeric	45012	0	81668.65
currency	local currency, missing if Euro	character	13	BGN	SEK
days	days per year in which this product is priced	character	2	365	366
product	composite of ATC, INN & strength, dosage form group and packsize group, separated by "~"	character	18320	A01AA01~sodium fluoride 0,25 mg~buccal, solid form~51<	V10XX04~lutetium (177lu) oxodotreotide 8417,5 mbq~parenteral, liquid form~1-10
nr_countries	Number of countries in which this product is priced	integer	28	1	28

# CALCU- LATIONS

- Calculation of PLIs
- Calculation of PPP by ÉKS method (“asterisk method”, all products representative)
- For countries where weights are available
  - Calculation of PPP by ÉKS method (“expenditure weighted”)
- Comparison with Eurostat E20-2 CGS survey
  - Rescale such that common country set = 100

Product name

Dosage form

INN & strength **Aciclovir**

Add search field

General text filter   Only Orphans  Only MEAs  Autocomplete

Denmark  Estonia  Finland  France  Greece  Hungary  Iceland  
 Ireland  Israel  Italy  Latvia  Lithuania  Netherlands  Norway  
 Poland  Portugal  Romania  Slovakia  Slovenia  Spain  Sweden  
 Switzerland  United Kingdom

1 - 50 / 738 Results

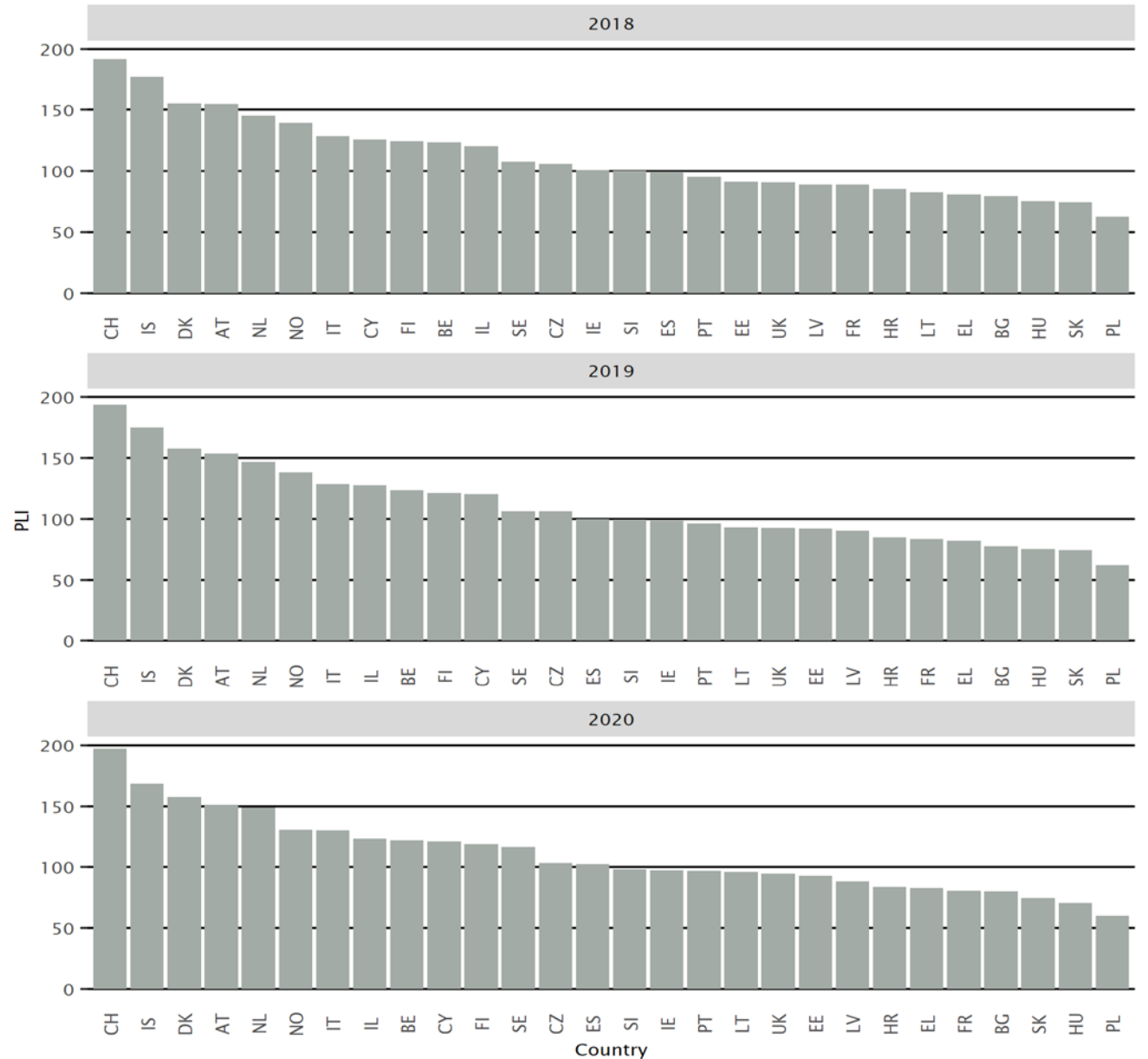
No	Product code	Country	Bov	Eov	Brand	Status	MEA	Product name	Package	Dosage form	Dosage form group	ATC	RoA
1	7103	Israel	01-01-2021	31-12-2021	acyclovenir	R	?	acyclovenir 250mg 5vial/10ml	5	powder for solution for infusior	parenteral, liquid form	J05AB01	parenteral
2	1192	Israel	01-01-2021	31-12-2021	zovirax	R	?	zovirax 200mg 25tab	25	tablet	oral, solid form	J05AB01	oral
3	7602	Israel	01-01-2021	31-12-2021	acyclo v	R	?	acyclo-v 200mg 30tab	30	tablet	oral, solid form	J05AB01	oral
4	4317	Israel	01-01-2021	31-12-2021	zovirax	R	?	zovirax iv for infusion 250mg 5amp	5	powder for solution for infusior	parenteral, liquid form	J05AB01	parenteral
5	1191	Israel	01-01-2021	31-12-2021	zovirax	R	?	zovirax susp 125ml	125	oral suspension	oral, liquid form	J05AB01	oral
6	7603	Israel	01-01-2021	31-12-2021	acyclo v	R	?	acyclo-v 400mg 30tab	30	tablet	oral, solid form	J05AB01	oral
7	8163	Israel	01-01-2021	31-12-2021	zovirax	R	?	zovirax tablets 400 mg 25tab	25	tablet	oral, solid form	J05AB01	oral
8	3047	Israel	01-01-2021	31-12-2021	zovirax	R	?	zovirax 800mg 35 dispers tab	35	dispersible tablet	oral, soluble solid form	J05AB01	oral
9	3166	Israel	01-01-2021	31-12-2021	valtrex	R	?	valtrex 500mg 42tab	42	tablet	oral, solid form	J05AB11	oral
10	3383	Israel	01-01-2021	31-12-2021	valtrex	R	?	valtrex 500mg 10tab	10	tablet	oral, solid form	J05AB11	oral
11	90882	Lithuania	01-07-2021	31-12-2021	valaciclovir actiofarma	R	?	valaciclovir actiofarma 1000 mg plėvelė	n21	film-coated tablet	oral, solid form	J05AB11	oral
12	5349	Lithuania	01-07-2021	31-12-2021	valaciclovir actavis	R	?	valaciclovir actavis 500 mg plėvele den	n10	film-coated tablet	oral, solid form	J05AB11	oral

# RESULTS

# “Asterisk method”

country	2018	2019	2020
Austria*	154	153	151
Belgium*	123	123	122
Bulgaria*	79	77	80
Croatia*	85	84	83
Cyprus*	125	120	121
Czech Republic*	105	105	103
Denmark*	155	157	157
Estonia*	91	92	93
Finland*	124	121	119
France*	88	83	80
Greece*	80	82	82
Hungary*	75	75	70
Iceland	177	174	169
Ireland*	100	98	97
Israel	120	127	123
Italy*	128	128	130
Latvia*	88	90	88
Lithuania*	82	93	96
Netherlands*	145	146	149
Norway	139	138	130
Poland*	63	62	60
Portugal*	95	96	97
Slovakia*	74	74	74
Slovenia*	100	99	98
Spain*	99	100	102
Sweden*	107	106	116
Switzerland	191	193	197
UK(*)	102	105	107

PLI for pharmaceutical products  
 asterisk method, all products representative  
 fixity: EU24 (2018, 2019), EU23 (2020)



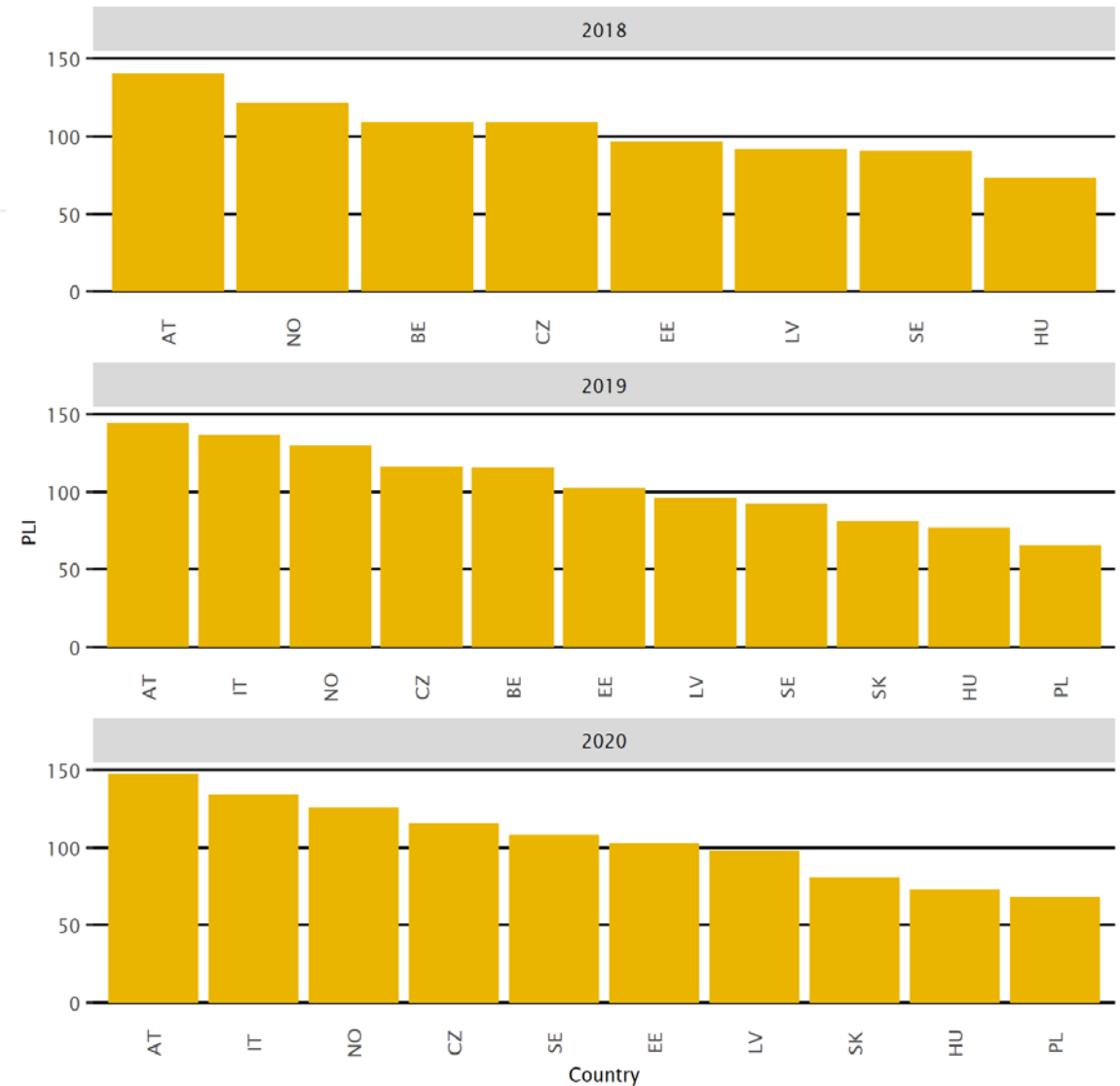
# Expenditure weights

country	2018	2019	2020
Austria*	140	144	148
Belgium	109	116	
Czech Republic*	109	116	116
Estonia*	97	103	103
Hungary*	74	77	73
Italy*		137	134
Latvia*	92	96	98
Norway	121	130	126
Poland		66	68
Slovakia		82	80
Sweden*	91	92	108

Volumes for France will be added for final report

## PLI for pharmaceutical products

expenditure weights  
fixity: EU7



# Comparison of Results

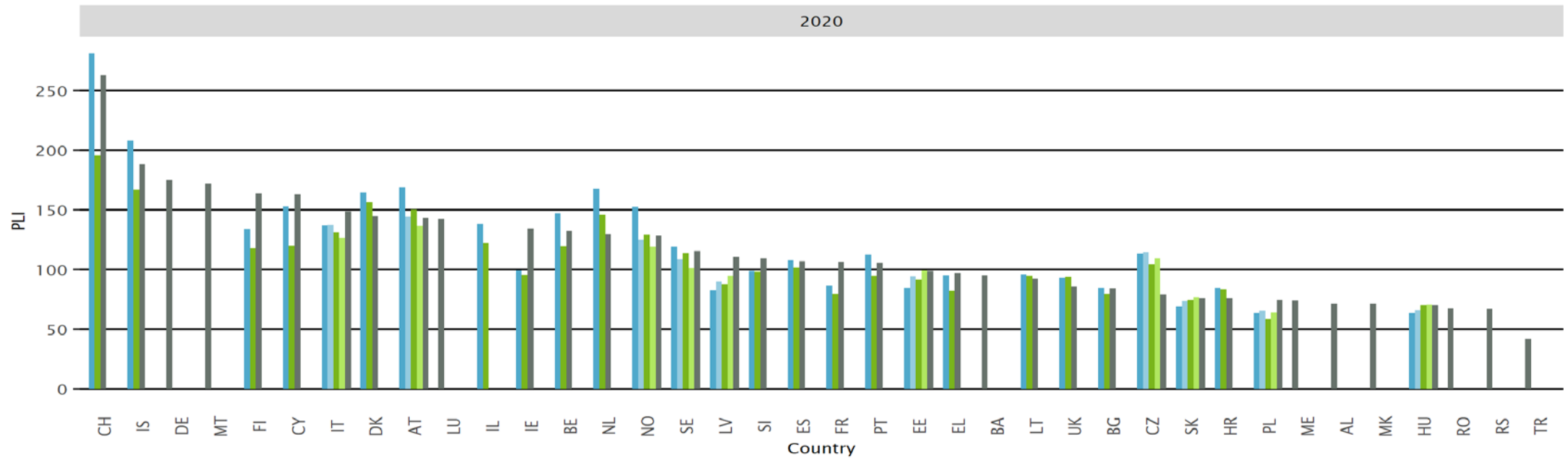
- We can limit the analysis to those Euripid data entries that are also in the CGS.
- This marginally improves correlations between PLI derived from Euripid and Eurostat CGS

correlation coefficient	Euripid, Eurostat-subsample, asterisks method, all products representative	Euripid, Eurostat-subsample, expenditure weights	Euripid, full sample, asterisk method, all products representative	Euripid, full sample, expenditure weights	Eurostat, E20-2Survey, Round 3
Euripid, Eurostat-subsample, asterisk method, all products representative	1,000				
Euripid, Eurostat-subsample, expenditure weights	0,966	1,000			
Euripid, full sample, asterisk method, all products representative	0,969	0,982	1,000		
Euripid, full sample, expenditure weights	0,945	0,988	0,975	1,000	
Eurostat, E20-2 Survey, Round 3	0,919	0,873	0,871	0,869	1,000



# Comparison of Results

PLI for pharmaceutical products  
fixity: AT, CZ, EE, HU, LV, NO, SE



- sample/method
- Euripid, Eurostat-subsample, asterisk method, all products representative
  - Euripid, Eurostat-subsample, expenditure weights
  - Euripid, full sample, asterisk method, all products representative
  - Euripid, full sample, expenditure weights
  - Eurostat, Consumer Goods Survey, Round 3

# COMPAR- ISON of EURIPID and CGS RESULTS

Data source (year = 2020)	Euripid				Eurostat
	full sample		Eurostat subsample		Consumer Goods Survey
	Calculation method	asterisk	weights	asterisk	weights
<b>Albania</b>					72
<b>Austria</b>	150 (+5%)	137 (-4%)	168 (+18%)	144 (+1%)	143
<b>Belgium</b>	120 (-10%)		147 (+11%)		132
<b>Bosnia and Herzegovina</b>					95
<b>Bulgaria</b>	80 (-5%)		85 (+1%)		84
<b>Croatia</b>	83 (+10%)		85 (+12%)		76
<b>Cyprus</b>	120 (-26%)		153 (-6%)		163
<b>Czech Republic</b>	104 (+32%)	109 (+38%)	113 (+44%)	114 (+45%)	79
<b>Denmark</b>	156 (+8%)		164 (+14%)		145
<b>Estonia</b>	91 (-8%)	99 (+0%)	84 (-14%)	94 (-5%)	99
<b>Finland</b>	118 (-28%)		133 (-18%)		164
<b>France</b>	79 (-25%)		86 (-19%)		106
<b>Germany</b>					175
<b>Greece</b>	82 (-15%)		95 (-2%)		97
<b>Hungary</b>	70 (0%)	71 (+1%)	63 (-10%)	66 (-6%)	70
<b>Iceland</b>	167 (-11%)		208 (+10%)		188
<b>Ireland</b>	95 (-29%)		99 (-26%)		134
<b>Israel</b>	122		138		
<b>Italy</b>	131 (-12%)	126 (-15%)	137 (-8%)	137 (-8%)	149
<b>Latvia</b>	88 (-21%)	95 (-14%)	82 (-25%)	90 (-19%)	111
<b>Lithuania</b>	95 (+3%)		96 (+4%)		92
<b>Luxembourg</b>					142
<b>Malta</b>					172
<b>Montenegro</b>					74
<b>Netherlands</b>	146 (+13%)		168 (+30%)		130
<b>North Macedonia</b>					71
<b>Norway</b>	129 (+1%)	119 (-7%)	152 (+19%)	125 (-3%)	128
<b>Poland</b>	59 (-21%)	64 (-15%)	63 (-15%)	65 (-12%)	74
<b>Portugal</b>	95 (-10%)		112 (+7%)		105
<b>Romania</b>					67
<b>Serbia</b>					67
<b>Slovakia</b>	74 (-2%)	77 (+1%)	69 (-9%)	73 (-3%)	76
<b>Slovenia</b>	98 (-10%)		99 (-10%)		109
<b>Spain</b>	102 (-5%)		108 (+1%)		107
<b>Sweden</b>	114 (-1%)	101 (-13%)	119 (+3%)	109 (-6%)	115
<b>Switzerland</b>	195 (-26%)		281 (+7%)		263
<b>Turkey</b>					42
<b>United Kingdom</b>	106 (+23%)		104 (+22%)		86



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# Discussion

# ANALYSIS OF MAJOR DEVIATIONS BY COUNTRY



- Reason: CZSO receives actual prices, Euripid contains statutory maximum retail price, same source
- Mitigation: Talk to source and adjust by -20%



- Reason: Different source (Pharmacies with online presence) and price type (reimbursement price), approximation method is okay
- Mitigation: Perhaps more accurate pharmacy dispensing fee, but no mitigation needed



- Reason: Pharmacies receive a EUR 2.39 (incl. 10% VAT) delivery fee (handling fee) for prescriptions; different source
- Mitigation: Add this fee to each pack price assuming that it are single prescriptions.



- Reason: Dispensing fee of ~ EUR 4.47 resp. 62.03 per pack not reflected in approximation method.
- Mitigation: Add this fee to approximation regime.



- Reason: CSP receives actual prices, Euripid contains statutory maximum retail price; partly same source
- Mitigation: Not yet clear, average discount rate needs to be analyzed with concrete examples

# WHAT IMPROVED SINCE PILOT 2017

- ✓ Representativity of products in CGS
- ✓ Dataset in Euripid expanded gradually
- ✓ Due to the new programming interface the exercise can easily be repeated, also approximation values can be adapted by research team
- ✓ Four more countries (NL, SI, IE, HR) included into analysis via approximation, soon one further (RO)
- ✓ Weighting by volumes is already possible for eleven countries, soon for 12 countries (new: FR)
- ✓ Bilateral exchange with Statistical Bureaus – everyone was really helpful and interested
- ✓ Overall deviations of results reduced

# WHAT STILL NEEDS TO BE WORKED ON

- ✓ Another check of coherency of findings after repetition of exercise with modified “approximations” and considering French volume date
- ✓ Some countries (e.g., DE, MT) are still missing and will be a challenge to add
- ✓ Euripid product set is lacking OTC products – price regulated ones might be included in the long run, but never all freely priced products
- ✓ Choice of reference values
- ✓ Differentiation between originators and generics – currently no priority in EURIPID



THANK YOU  
FOR YOUR  
ATTENTION!

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claudia.habl@goeg.at,  
martin.zuba@goeg.at  
www.euripid.eu