COUNTRY HEALTH PROFILE: THE CASE OF POLAND

The impact of Underinvestment on Medicines and Health Services in Poland

1st Draft

Zawada A., Holownia-Voloskova M., Yfantopoulos J.

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Health is a value in itself.

- **Health/Wealth** is also a precondition for economic prosperity.
- People's **health** influences **economic outcomes** in terms of **productivity,** labor supply, human capital and public spending.
- **Investing in sustainable health systems** combines **innovative reforms** aimed at improving **cost-efficiency**.
- **Investing in people's health as human capital** helps improve the health of the population in general.
- **Investing in health helps the EU and the CEE** countries rise to the challenges identified inits Health **Strategy Europe 2025**.
- Evidence across the EU and the CEE Member States reveals the significant **underinvestment** in health and the **need for policy intervention to improve access and Health Outcomes.**

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1. Summary

The objective of this study was to compare the health outcomes, expenditures, and unmet medical needs in Poland with European Union average (EU-27) and to assess the convergence or divergence of the trends from the Poland's entrance in EU in 2004 onwards. The main concern of our analysis was to examine whether the polish trends towards the EU-27 average was accomplished or not and to what extent. A short summary follows highlighting the key findings of our analysis

In terms of health outcomes, despite of the success in decreasing the infant mortality rates and the increasing trends in life expectancy and healthy life years Poland remains below the EU-27 average. A gender gap can be seen, with worse indicators for male than for female populations.

The standardized preventable and treatable mortality raised after accession in EU increasing the distance to EU-27 (divergence).

Improvements in self-perceived health, contributed to the convergence between Poland and the EU-27 with females perceiving their health worse than males. In terms of oncological diseases, the trends are distressing. A relatively low incidence of cancer cases in Poland is accompanied with a higher than in EU-27 mortality for the most frequent cancers cases This points out the issues of timely diagnosis, proper medical proceedings and/or the access to the pharmacological treatment or health services.

The COVID-19 pandemic contributed significantly to the deterioration of health outcomes in Poland. During the COVID-19 pandemics (2019-2020) life expectancy and healthy life years were among other health indicators have been reduced at faster rate than the EU average and the rest of Northern European Countries.

As GDP per capita in both Poland and EU-27 is steadily growing, the gap between them remains similar over the period 2010-2020. (A small decrease is observed in 2019-2020).

While the gap EU-27 average vs PL in the health care expenditure as % of GDP slowly grew in 2004-2019 and the difference in health expenditure per capita stayed almost the same. The share of public funds in health expenditure in EU-27 was about 50% higher compared to Poland in 2019. The main difference in that respect was pharmaceutical spending. Total pharmaceutical expenditure in Poland grows year by year. However, private share in drug spending increased

both in Poland as well as in the EU-27. Although out-of-pocket (OOP) share in Polish health care budget is systematically decreasing, it is still one third higher than EU-27 average. In terms of the categories of services financed, in Poland a bigger portion of public funds than EU-27 average is directed at inpatient care while less at long-term care and prevention.

While health outcomes and expenditure measures are based on administrative data, the unmet health needs are based on the EU-SILC households survey in which people were asked to self-report their unmet during the previous 12 months. General trends for percentages of people reporting unmet medical needs in Poland are convergent with other EU countries reaching the level of the EU-27 average in 2020. However, a more detailed analysis revealed that the gap between EU-27 average and Poland still exists in vulnerable populations such as those of the low-income quintile and people over 65 years of age. The most common reason of unmet needs in Poland is caused by long waiting lists and the next is financial issues. The distance to the medical services provider is relatively low in people's assessment . In terms of accessibility of specific health care services, the biggest issue is the access to prescribed medicines due to financial reasons, specifically in the poorest population. Despite destructive effects of COVID-19 on health outcomes, a high share of Polish citizens reported good or very good health and self-reported unmet needs have been reduced , responding to EU-27 levels.

2. KEY FINDINGS

1. Health Outcomes:

- A big effort has been done in Poland to diminish the gap between Poland (PL) andEU-27 average in infant mortality. The succeeded value of 3.6 deaths rate in 2020 decreased the gap to 0.3.
- The gap in life expectancy at birth, between PL and EU-27, has increased from 3.3 y. to 4.5 y. between 2004 and 2020. Especially that divergence have been visible in COVID-19 pandemic (2019 to 2020), while this gap was dramatically increased by 1.2 in the general population (1.6 years for men and 1.1 years for women).
- Healthy life years at birth is an indicator that has been waving specifically for female population, being timely better than EU-27 average (the gap <0) while reaching 0.2 in 2020. However, for the male population it is steadily lower than EU-27 average with a gap reaching 3.2 y. in 2020, while in general population the gap in 2020 was 1.7 y. The gender gap (the difference between men and women) in healthy life years at birth hardly fall below 3 y. Thus, the gap in healthy life years is 1.7 due to gender gap.
- The gap between PL and EU-27 in standardized preventable and treatable mortality was the smallest in 2014 (90.4) and have been rising to 99.4 in 2017, revealing potential problematic issues with prevention and treatment.
- Shares of population perceiving their health as good or very good have been rising in Poland a bit faster than EU-27 average so the gap in this indicator was decreasing to 7.9 percentage points (7.5 percentage points in males and 7.9 percentage points in females) in 2020. However, it is interesting to observe separately the gaps between PL and the EU-27 in the general population and males and females in order to find out that Polish women assess their health more critically than the EU-27 ones although it may be in fact better (as discussed above). Polish men assess their health closely to EU-27 average.
- In terms of oncological diseases, the incidence per 100.000 was higher for EU-27 average than in Poland with the biggest differences found in prostate and breast cancer (32.7 and 23.7, respectively) in 2020. At the same time, mortality from prostate cancer in Poland exceeded 22.5 deaths per 100 000 cases that of EU-27 average, and from breast cancer 7.7 per 100 000 cases.
- During the COVID-19 pandemics (2019-2020) the life expectancy in Poland has been reduced by 1.4 years, twice as much as EU-27 average. Healthy life years at birth have been reduced in

the total population and in males but not in females. Poland was in a group of E.U countries with the highest absolute number of excess deaths, specifically in males, and among the countries with the highest excess of years of life lost per 100 000 population. However, self-reported health maintained good or very good was measured in the increasing shares of the population and self-reported unmet needs have been reduced to EU-27 levels.

2. GDP of Poland:

- As GDP per capita in both PL and EU-27 is steadily growing, the gap between them remains the same during the period 2010-2020.

3. Health Expenditures:

- The gap between the EU-27 average and PL in the health care expenditure as share (%) of GDP slowly grew during 2004-2019 from 3.1%-points to 3.5%-points. The gap between PL and the EU-27 in health expenditure per capita waves but in 2019 was almost the same as in 2014. The share of public funds in health expenditure in Poland in 2019 was lower than in EU-27 (71.8% vs 79.7% respectively).
- Comparing the proportion of public spending on health care services in PL vs EU-27 the main difference relates to pharmaceutical spending (shares of 36% and 57% respectively in 2019).
- Total pharmaceutical expenditure in Poland grows faster than the EU-average narrowing the gap with the EU-27. The public share of pharmaceutical spending remains unchanged over time while the private share grows faster. This reveals an important health policy topic that high drug copayment may be an issue in Poland in comparison with EU-27.
- The share of out-of-pocket (OOP) spending is higher in PL than EU-27 average (PL 20.1% vs EU-27 15.3%); however, it should be noticed that OOP share in Polish health care budget is systematically decreasing while EU-27 share remains the same, so the convergence trend can be noticed. OOPs in PL are addressed mostly on drugs (PL 12.6% of total spending vs EU-27 3.7% of total spending).
- With regard to the categories of services financed, in PL a bigger proportion of public funds is directed at inpatient care (PL 38% vs EU-27 30%). For long term care Poland devotes much less than the EU average (i.e. PL 7% vs EU-27 18%) It should be noted that the Polish spending on prevention is roughly equal to 32% of EU-27 average.

4. Unmet medical needs:

- Self-reported unmet medical needs are measured in Eurostat EU-SILC households survey and respondents refer to such needs during the previous 12 months. These data for general Polish population seem to be in the convergent trend as compared to EU-27 average, and – what is specifically intriguing in the light of health care outcomes and expenditure for Poland – the gap closed from 4.8% in 2010 to 0 during COVID-19 pandemics (2020).
- However, when comparing the vulnerable population groups, namely the lower-income quintile as compared to the highest-income quintile, the gap of 6.8%-points between EU-27 and Poland (2019) in the poor people mainly by unmet needs for prescribed medicines (9.0 %-points) and medical care (6.7%-points).
- The biggest burden of unmet needs in Poland is caused by long waiting lists in the1st (8%-points gap EU-27 vs PL) as well as in the 5th income quintile (5.8%-points gap); the next reason in the 1st income quintile are financial issues (5.8%-points gap). The distance to the medical services provider is an issue of relatively low significance.
- Detailed analysis of unmet health needs in people over 65 years of age as compared to younger people revealed the biggest gap between EU-27 attributed to waiting lists: 12.4%-points in population over 65 years of age and 4.6%-points in younger people as well as 5.8%-points gap due to financial reasons in the elderly.
- Self-reported unmet needs for specific health care-related services due to financial reasons revealed the biggest gap between EU-27 and PL (1.7%-points) in the access to prescribed medicines.
- The trend of overall unmet need for medical examination in Poland is like the one of general medical unmet need reaching the EU-27 level in 2020. However, analyzing the issue of waiting lists, a difference exists between the EU-27 and PL at 1st (0.5%-points) and in 5th income quintile (2.3%-points gap).

3. The objectives of this study

The objectives of this study were to assess the impact of underinvestment on medicines and health services in Poland reviewing data on health outcomes, expenditures, and unmet medical needs of the Polish population, and comparing them against European Union average (EU-27). The specific focus is put on the data starting 2004 when Poland joined European Union gaining an incentive to faster economic growth. In terms of methodology, our analysis is based mainly on Eurostat data, complemented by the data from OECD, and Central Statistical Office in Poland. This enabled preparation of this report in an evidence-based way, and when there was need for more elaboration and explanation of our findings', additional published data were used. Additionally, to further elaborate our findings, we describe the overall health and economic background in Poland and some emphasis is given on the implementation of pharmaceutical policies.

4. Country background

Poland is placed in Central Eastern Europe. With the surface of about 312700 square kilometers, it is 9th country in Europe in size. In terms of population is the 5th country with 37.7 million[1] inhabitants on January 1st, 2022. (Table 1). The fertility rate is 1.39 children per woman – a bit lower than EU-27 mean of 1.5, and the share of elderly population over 65 years is 18.2% of the total population (EU-27 mean – 20.6%). The GDP per capita was estimated at 22718 euro standardized by purchasing power parity (PPP[2]) (EU-27 mean – 29 801-euro PPP). The unemployment rate is 3.2% (EU-27 mean – 7.1%), and the poverty rate is estimated at 14.8% (EU-27 mean – 16.6%).

Table 1. Poland and EU-27 averages – basic socioeconomic data (2020)

The measure	Poland	EU-27
Population size	37.7 million	
Fertility rate	1.39	1.50
Share of elderly population >65 y. o. (%)	18.2	20.6

[1] All data comes from Eurostat database and are for 2020 unless otherwise stated.
[2] PPP – purchasing power parity; the rate at which the currency of one country would have to be converted into that of another country to buy the same amount of goods and services in each country (https://www.imf.org/external/pubs/ft/fandd/basics/ppp.htm accessed 12.09.2022)

GDP per capita (PPP, EUR)	22 718	29 801
Unemployment rate (%)	3.2	7.1
Poverty rate (%)	14.8	16.6

Source: Eurostat data

5. Health system in Poland

In the era before 1989, the Polish health care system was centrally managed grounded on the rules of Beveridge model. It was financed by public funds while not formal insurance taxes for individual people were issued nor official lists of reimbursed services or drugs were implemented.

The Polish Constitution of 1997 guarantees to all citizens the right to equal access to healthcare services financed from public sources. Currently, the Polish healthcare system is based on social health insurance. The mandatory healthcare contribution amounts to 9% of the salary, is paid to the National Health Fund through the Department of Social Insurance (ZUS, Zakład Ubezpieczeń Społecznych). The National Health Fund (NHF) finances healthcare services which are provided to the insured, and it reimburses medicines. A portion of healthcare contributions is financed from taxes: the state budget or special purpose funds make healthcare contributions among others for: students (till 26 y.o.), farmers and their family members as a part of the Agricultural Social Insurance Fund (KRUS), employment agencies – for the unemployed, social welfare centers – for non-working persons, not registered in employment offices, meeting the income criterion, the state budget – for the clergy. Some healthcare procedures under the universal public health care system, including highly specialized services are funded directly by the state budget (e.g. Emergency Medical Services). Apart from the NHF and the state budget expenditure of universal public healthcare, a small portion is financed by the employers (e. g. services referring to occupational medicine).[3]

The Ministry of Health (MoH) plays a central role in health sector governance, although it shares this responsibility with three levels of territorial government: municipalities oversee primary care; counties are responsible for smaller county hospitals; and voivodeships are responsible for generally larger regional hospitals. The MoH supervises the highly specialized tertiary care providers. Private facilities provide mainly outpatient care, while most inpatient care is provided in hospitals, which are

[3] https://www.emc-sa.pl/en/investor-relations-information/company-activity/the-polish-healthcare-system#:~:text=The%20healthcare%20system%20in%20Poland,insured%20and%20it%20reimburses%20medicines (accessed 9.08.2022)

mostly public. The National Health Fund (NHF) is the sole purchaser in the healthcare system. It operates through its 16 voivodeship branches, which manage the purchasing of health care services in their regions.[4]

A three-level health services system exists in Poland. Health care system is based on the First Point of Contact Health Care services (BHC, podstawowa opieka zdrowotna, POZ) delivered by general practitioners (GP). A GP **is a gatekeeper** in terms of specialist's referral. Specialists provide healthcare services of the second level, and hospitals – the third level services.

The "**healthcare services basket**" forms a positive list of the services covered by the public fund, which may be delivered free of charge to every insured person. However, there are practical limitations in the healthcare services availability, e. g. long waiting queues for some services like a hip replacement.

Commercially available additional health insurance is offered based on "general" law on insurance activities but is not widely issued due to lack of specific legislation (in 2015 about 5% of healthcare spending[5]). Instead, some medical commercial entities offer subscriptions for healthcare services packages, which in many cases are financed/co-financed by the employers. The monthly fee covers access to a network of GPs and specialists as well as diagnostic procedures but rarely private hospital services.

Both **private and public entities** operate in the market of healthcare services. It should be noted that healthcare services performed by private entities can be either payable or free of charge for patients. In the latter case, it is covered by the National Health Fund, based on an agreement concerning the provision of health care services (i.e., contracts), and concluded pursuant to the same terms and conditions as in the case of public entities.[6]

Outpatient healthcare services in Poland financed by public funds have been provided by 22.000 out-patient clinics and 3.800 medical and dentistry practices in 2021.[7] In total, 285.9 million of medical

[4] Owczarczyk A. Public expenditure on healthcare in Poland (2010-2020). Wydatki publiczne na ochronę zdrowia w Polsce (2010-2020) Zeszyty Naukowe Uniw. Przyrodniczo-Humanist. w Siedlcach. https://doi.org/10.34739/zn.2020.53.04

[5] Finansowanie Ochrony Zdrowia w kontekście efektów społeczno-gospodarczych. Raport 2018. Raport przygotowany przez IQVIA dla Związku Pracodawców Innowacyjnych Firm Farmaceutycznych INFARMA. Warszawa, sierpień 2018

[6] https://www.emc-sa.pl/en/investor-relations-information/company-activity/the-polish-healthcare-system#:~:text=The%20healthcare%20system%20in%20Poland,insured%20and%20it%20reimburses%20medicines (accessed 9.08.2022)

[7] Central Statistical Office in Poland. (GUS, Główny Urząd Statystyczny) https://stat.gov.pl/obszary-tematyczne/zdrowie/zdrowie/ambulatoryjna-opieka-zdrowotna-w-2021-roku,13,6.html (accessed 12.08.2022)

visits were offered – 28% of them in terms of telemedicine – and 30.7 million of dentistry visits.[8] However, it should be noted that in Poland significant proportion of the dentistry services delivered are financed directly by the patients[9] (as only the very basic care is publicly financed).

At the end of 2021 around 11.9 thousand outpatient pharmacies were active (a decrease of 1.6-percentage points compared to 2020) and 1.1 thousand pharmacy outlets (0.4-percentage points decrease); additionally, 164 retail pharmacies and dispensaries were active which are allowed to sell non-prescription medicinal products by mail order.[10]

6. European Health Consumer Index – a tool for European countries health care systems comparison[11]

European Health Consumer Index (EHCI) is calculated (starting in 2005 for 35 European countries) on the base of a unified questionnaire divided into 6 sections (indicators) (for years 2014-2018; earlier index reports are hardly available):

1. Patient rights and information score (PatR)
2. Accessibility (waiting times for treatment) score (Acc)
3. Outcomes score (Out)
4. Range and reach of services score (Serv)
5. Prevention score (Prev)
6. Pharmaceuticals score (Pharm)

The details of methodology are changing in time to time and are reported in every EHCI report. It should be noted that this methodology has been criticized by experts from the European Observatory on Health Systems and Policies[12] for the following:

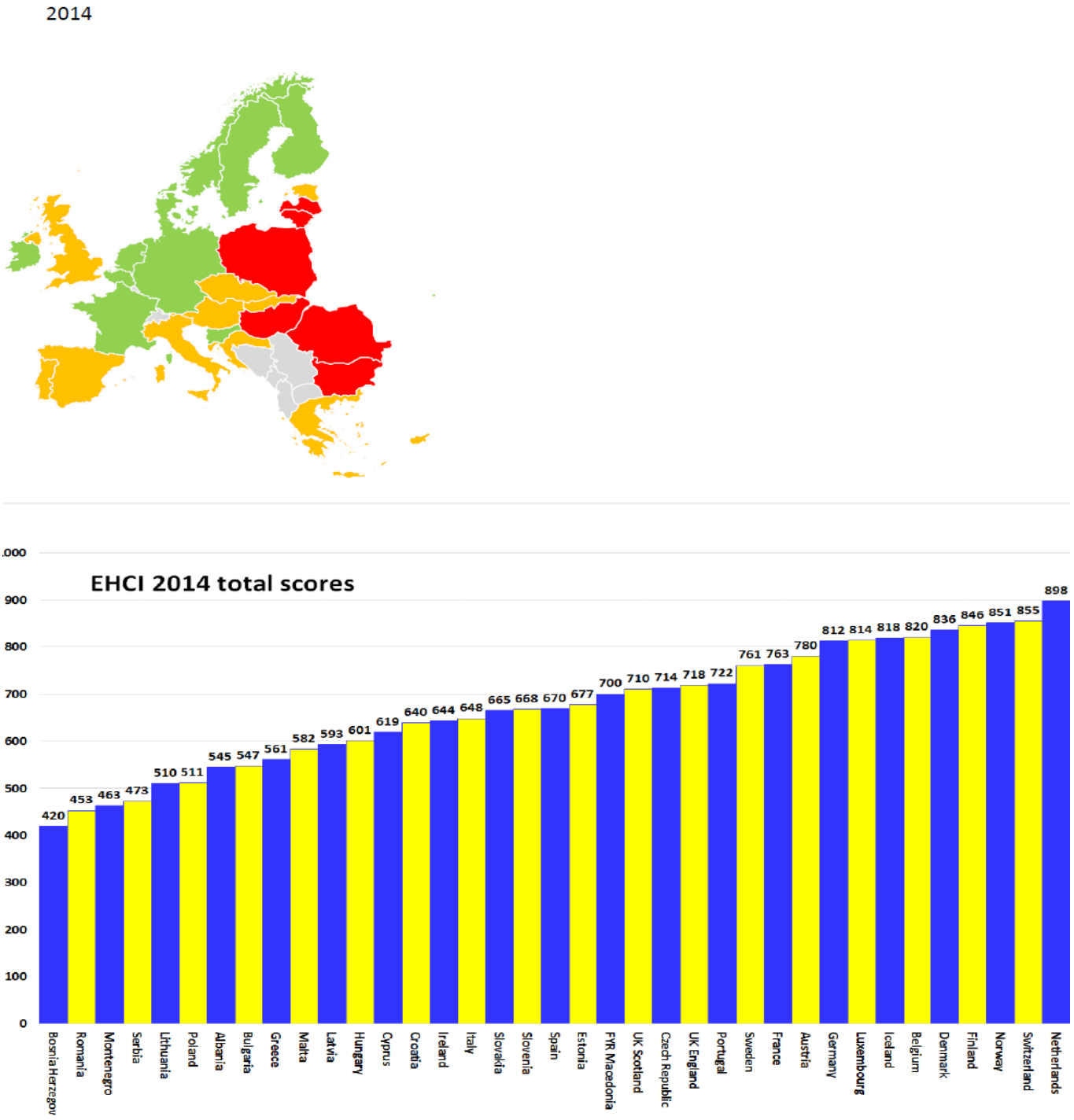
- The index is constructed by scoring performance as good, intermediary or not-so-good, based on arbitrary cut-off points.

[8] Ibidem
[9] Central Statistical Office in Poland. (GUS, Główny Urząd Statystyczny) https://stat.gov.pl/obszary-tematyczne/zdrowie/zdrowie/ochrona-zdrowia-w-gospodarstwach-domowych-w-2020-r-,2,7.html (accessed 12.08.2022)
[10] Central Statistical Office in Poland. (GUS, Główny Urząd Statystyczny) https://stat.gov.pl/obszary-tematyczne/zdrowie/zdrowie/apteki-i-punkty-apteczne-w-2021-roku,15,6.html (accessed 12.08.2022)
[11] https://healthpowerhouse.com/publications/ (accessed 19.08.2022)
[12] Cylus J, Nolte E, Figueras J, McKee. M. What, if anything, does the EuroHealth Consumer Index actually tell us? theBMJOpinion https://blogs.bmj.com/bmj/2016/02/09/what-if-anything-does-the-eurohealth-consumer-index-actually-tell-us/ (accessed 27.08.2022)

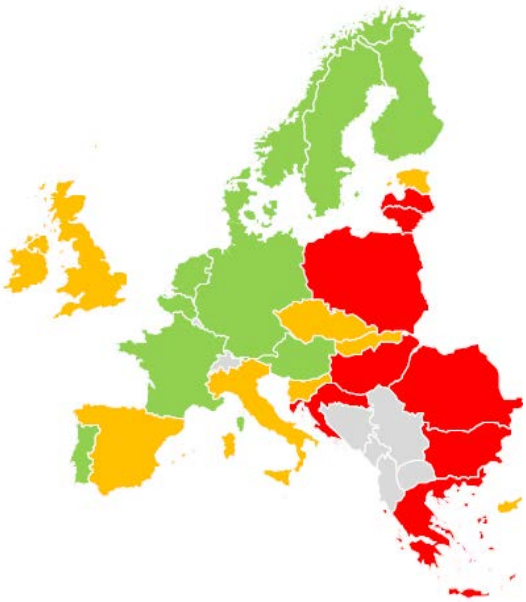
- It is not evidence based how many points are allocated to each indicator. 225 points are allocated to accessibility, but only 250 to health outcomes.
- The indicators are a mix of trends over time and cross-sectional rankings.

The 2018 EHCI report is the last one available, so no assessment of health care systems during the COVID-19 pandemics has been performed according to EHCI methodology. However, assessments of health care systems performance in specific fields of medicine are available such as European Diabetes Index of 2014 and European Heart Index of 2016.The results of the assessment are produced in terms of scores for every one of six indicators (partial scores) as well as the total score (sum of partial scores). A three color system is used to indicate the score of each country in the map of Europe : green is used to indicate the best scores (the highest), amber the intermediate ones (the middle scores) and red the not-so-good health care systems (lower scores). In the 2018 EHCI report there is a statement, that the green countries on the map are scoring >750 on the 1000-point scale, while red – scoring <650; the minimum possible score is 333. Polish healthcare system was always marked red getting lower scores. Poland was ranked as (Figure 1): the best – 31st in 2016 (best place achieved) and 34th in 2015 (worst result in the European scoring system). As can be seen in the Table 2, Poland gets the highest scores in the Prevention index and the lowest in Accessibility index.

Figure 1. Health systems performance according to EHCI in 2014 and 2018



2018



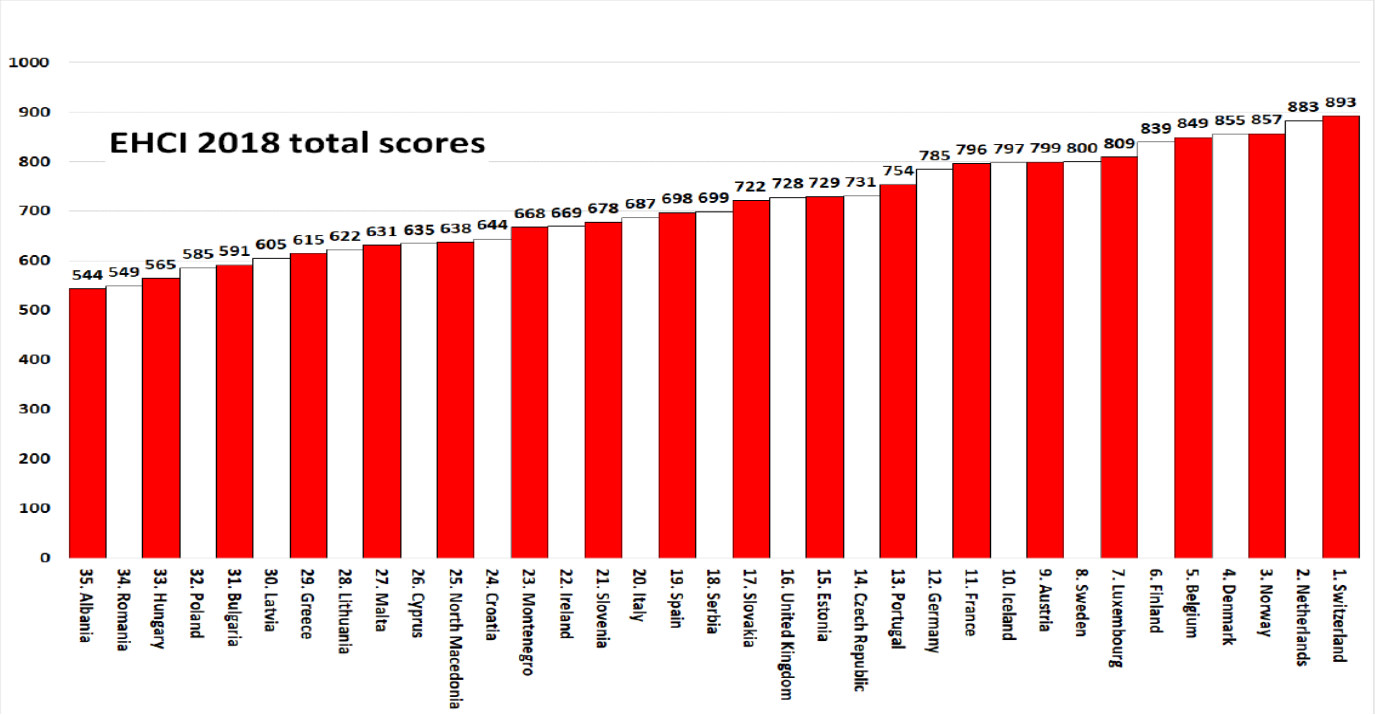

EHCI 2018 total scores
1000
900
800
700
600
500
400
300
200
100
0
544 549 565 585 591 605 615 622 631 635 638 644 668 669 678 687 698 699 722 728 729 731 754 785 796 797 799 800 809 839 849 855 857 883 893
35. Albania
34. Romania
33. Hungary
32. Poland
31. Bulgaria
30. Latvia
29. Greece
28. Lithuania
27. Malta
26. Cyprus
25. North Macedonia
24. Croatia
23. Montenegro
22. Ireland
21. Slovenia
20. Italy
19. Spain
18. Serbia
17. Slovakia
16. United Kingdom
15. Estonia
14. Czech Republic
13. Portugal
12. Germany
11. France
10. Iceland
9. Austria
8. Sweden
7. Luxembourg
6. Finland
5. Belgium
4. Denmark
3. Norway
2. Netherlands
1. Switzerland

Table 2. EHCI scores for Poland for 2014-2018

Year	2014	2015	2016	2017	2018
Number of countries scored	37	35	35	35	35
Total score for Poland (PL placement)	32 (511/898)	34 (523/916)	31 (564/927)	29 (584/924)	32 (585/893)
Subscore PatR – PL placement (PL score/max score)	27 (96/146)	32 (79/146)	32 (66/125)	31 (79/125)	32 (79/125)
Subscore Acc – PL placement (PL score/max score)	33 (100/225)	35 (100/225)	35 (100/225)	30 (125/225)	28 (138/225)
Subscore Out – PL placement (PL score/max score)	35 (104/240)	25 (146/240)	26 (188/288)	27 (167/289)	30 (167/278)
Subscore Serv – PL placement (PL score/max score)	27 (88/150)	31 (63/144)	29 (63/125)	28 (63/125)	30 (57/125)
Subscore Prev – PL placement (PL score/max score)	27 (71/107)	24 (83/113)	19 (95/119)	22 (95/119)	19 (89/119)
Subscore Pharm – PL placement (PL score/max score)	28 (52/86)	26 (52/86)	27 (52/86)	24 (56/89)	24 (56/89)

Note: PatR – Patient rights and information score, Acc – Accessibility score, Out – Outcomes score, Serv – Range and reach of services score, Prev – Prevention score, Pharm – Pharmaceuticals score.

Source: EHCI data

Looking closer at the Outcome scores – only in 2016 Poland was close to get "the amber color" (good performance) in this subscore (65% of points gained; compare to 2018 thresholds presented above); in other years the scores are lower. The Pharmaceuticals subscores for Poland have been lower than 65% for all the time presented.

It should be noted that Poland got a relatively high (18th position among 30 countries: score of 627/864) in the European Heart Index in 2016 and a lower (25th position among 30 countries: score of 564/936) in the European Diabetes Index in 2014.

These relatively "not-so-good" performances of Polish health care system may trigger a further analysis of the potential problematic issues, as the best health care system possible is the final goal.

7. Health outcomes trends in Poland

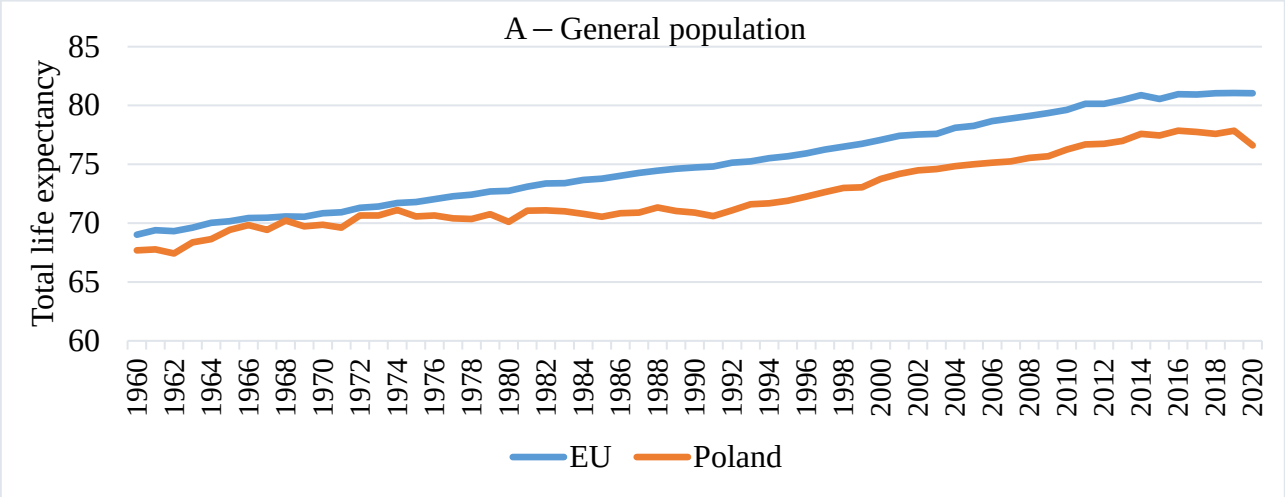
This section aims at an overall assessment of Polish health outcomes over time and comparing it with the European Union average of 27 Member States

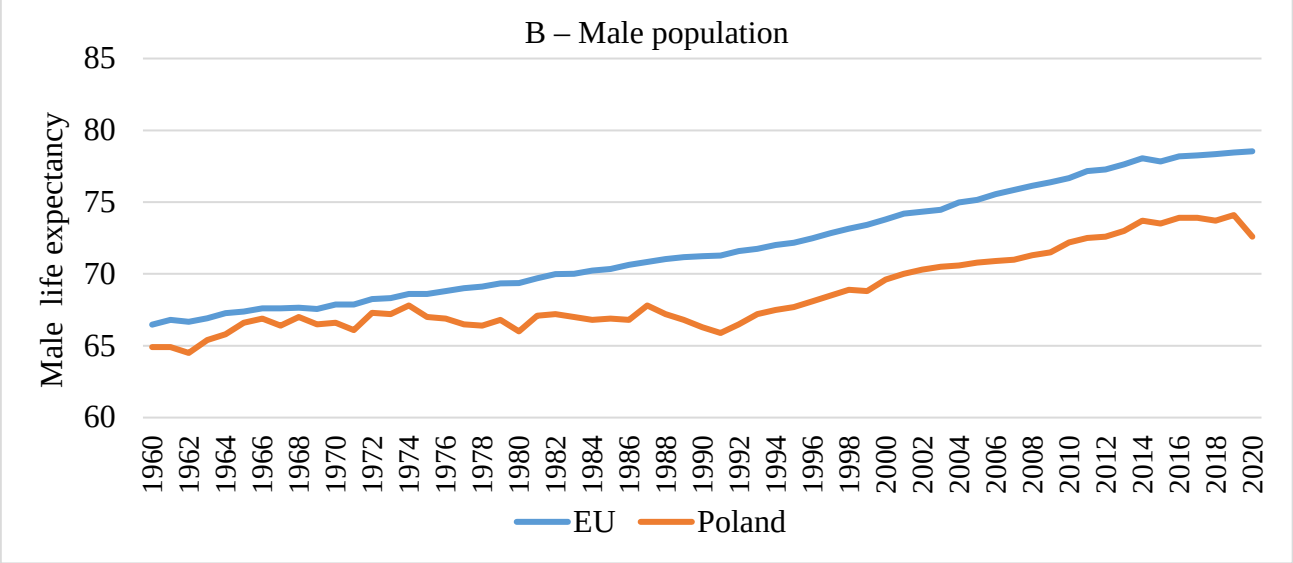
7.1. Life expectancy[13]

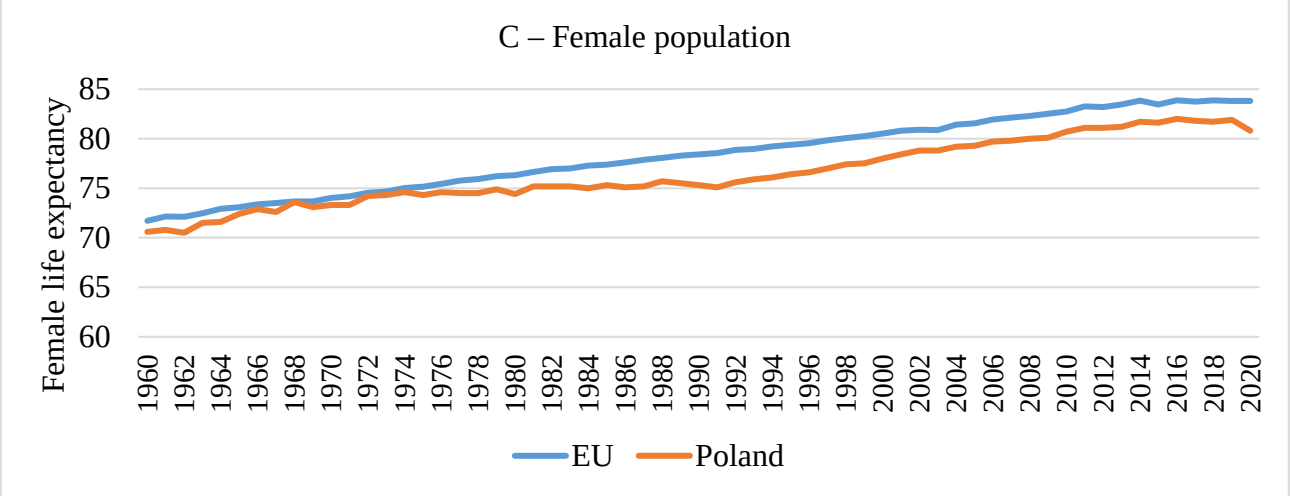
The gap in life expectancy at birth in total population between Poland and EU-27 has grown since 1960. The biggest year-to-year difference in the gap was recorded in 2019 to 2020. Life expectancy at birth in Poland reached 77.9 years in 2019, but fell dramatically in 2020 to 76.6, due to COVID-19. This reduction may be attributed to limited access to health care during the pandemic. Hence, life expectancy at birth decreased temporarily by 1.4 years in 2020 compared to 2019, which was among the largest reductions in life expectancy recorded within the European Union (EU-27 average decrease 0.7 y.) (Figure 2A). Examining gender differences since 1960, the gap between Poland and EU-27 was bigger in men than in women. Male life expectancy in Poland has increased from 70.7 in 2004 to 74.1 in 2019, that is a total of 3.4 years. Life expectancy at birth has decreased due to COVID-19 pandemic in 2020 in males to the 2012 level (72.6) (Figure 2B). In females, life expectancy at birth has increased from 79.2 in 2004 to 81.9 in 2019, a total of 2.7 years and in 2020 felt down to 80.8 years (Figure 2C). Difference between females and males (gender gap) in terms of life expectancy at birth, in Poland, has decreased from 8.5 years in 2004 to 8.2 years in 2020, being the lowest in 2017 (7.9 years). At the same time, the gender gap in life expectancy at birth for EU-27 has also decreased from 6.4 years in 2004 to 5.6 years in 2020, that is 0.8 years. Therefore, difference between genders for EU-27 and Poland has increased from 2.1 years in 2004 to 2.6 years in 2020. In general population, life expectancy at birth (Figure 2D) the gap between EU-27 average and Poland has decreased between 2004 and 2019 from 3.3 years to 3.2 years respectively, but it has grown between 2019 and 2020 due to COVID-19 pandemic (up to 4.5 years). In male population, life expectancy at birth the gap between EU-27 and Poland has increased between 2004 and 2020 from 4.3 years to 5.9 years, with a maximum of increase in year-to-year basis from 2019 to 2020 by 1.6 years. In female population, the gap in life expectancy at birth, between EU-27 and Poland has increased between 2004 and 2020 from 2.2 years to 3.0 years: a disproportionate part of this increase is recorded in the pandemic year of 2020, when on the year-to-year basis life expectancy gap in females raised by 1.1 year.

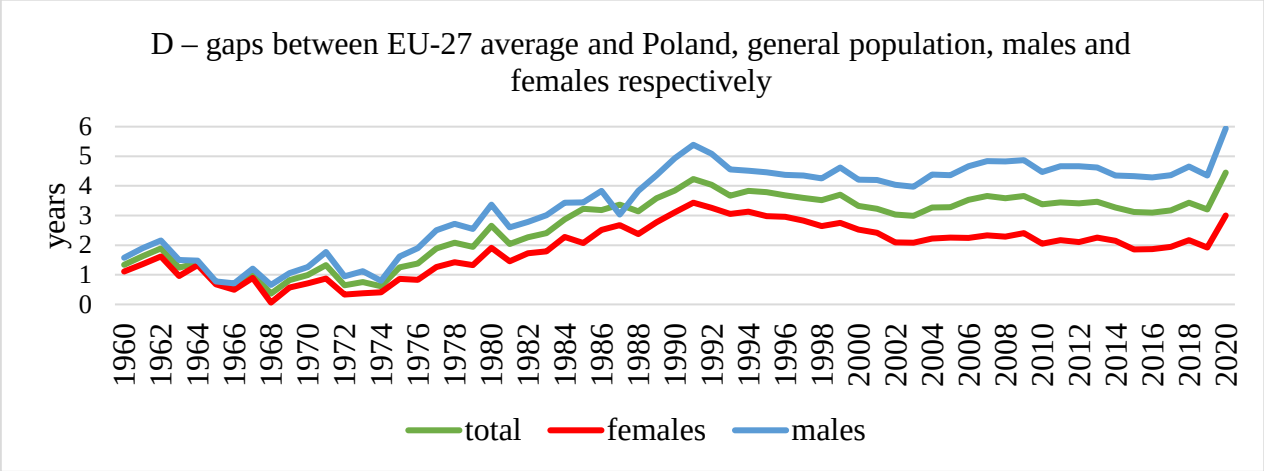
[13] World Bank Data https://data.worldbank.org/indicator/SP.DYN.LE00.IN (accessed 15.08.2022)

Figure 2. Life expectancy at birth for general population (A), male (B), and female (C) in Poland and in the EU-27 average (1960-2020). The gaps (D) between Poland and EU-27 in the general population, males and females (1960-2020)









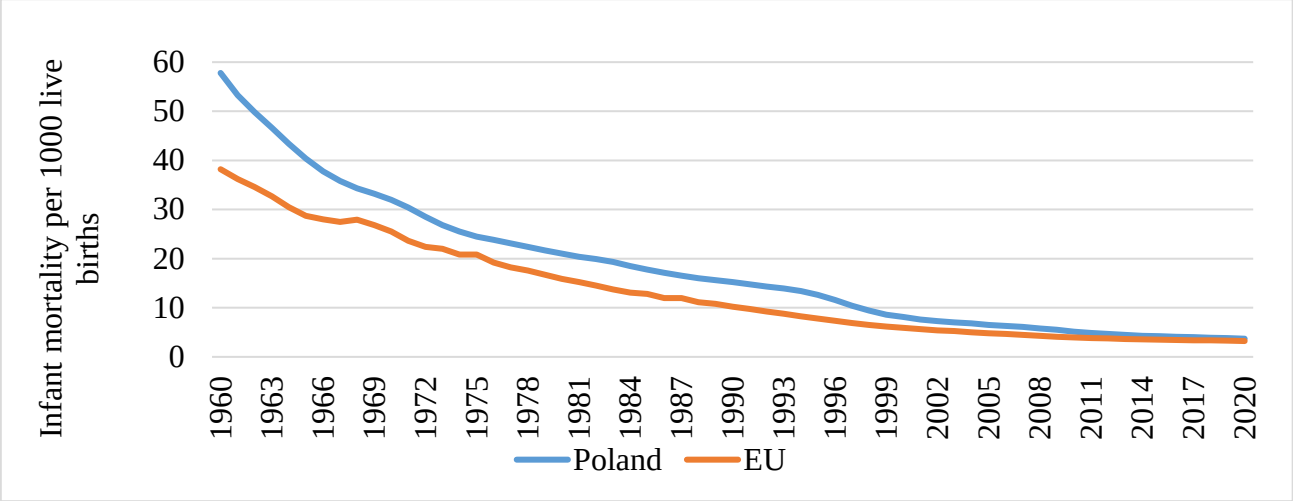
Source: World Bank Health Data

7.2. Infant mortality[14]

The gap between infant mortality rates in European Union (as expressed on an average rate of EU countries) and Poland has been steadily decreasing since 2004. The difference in infant mortality rate was 20 infants per 1000 live births in 2004 and dropped down to 0.5 child per 1000 live births in 2020 (Figure 3). That should be acknowledged as a big achievement as explains prof. Ewa Helwich, Polish national consultant in neonatology[15]. Most of infant deaths relates to preterm birth in very early stages of the pregnancy (in many countries this is considered as miscarriage).On the other hand, the Polish health care system is regarded as one with the highest rates of deliveries by caesarean section in Europe, caused by the high rate of C-sections on demand (e.g. without medical reasons).[16]

[14] Organisation for Economic Co-operation and Development data https://data.oecd.org/healthstat/infant-mortality-rates.htm (accessed 16.08.2022)
[15] The interview with prof. Ewa Helwich, national consultant in neonatology (in Polish): W kilka dekad umieralność niemowląt w Polsce spadła 30-krotnie. Ale ten sukces można zmarnować. Puls Medycyny https://pulsmedycyny.pl/w-kilka-dekad-umieralnosc-niemowlat-w-polsce-spadla-30-krotnie-ale-ten-sukces-mozna-zmarnowac-1123721 (accessed 15.08.2022)
[16] Ibidem

Figure 3. Infant mortality in Poland compared to EU-27 average (1960-2020)



Source: OECD Health Data Set

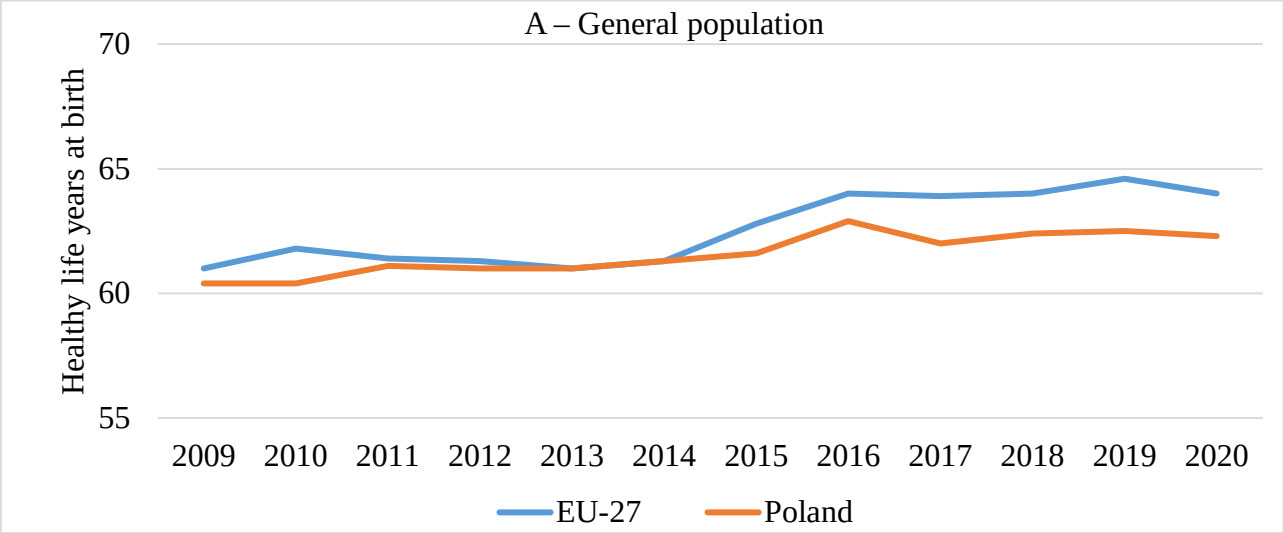
7.3. Healthy life years at birth[17]

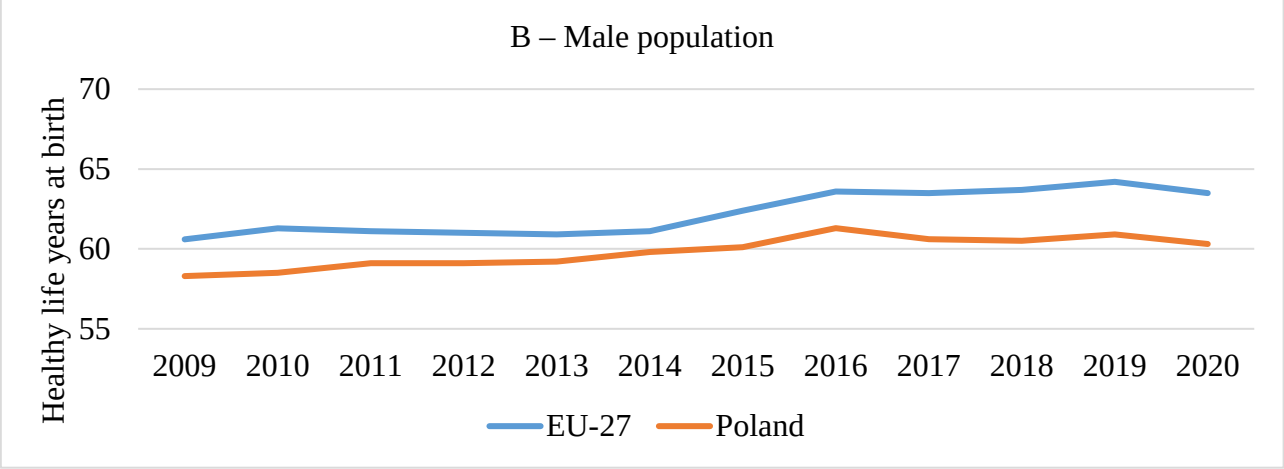
Healthy life years at birth (e.g. the number of years that a person is expected to live in a healthy condition) in total population of Poland have increased from 60.4years in 2009 to 62.3years in 2020. The gap between Poland and EU-27 average has also increased from 0.6 in 2009 to 1.7 in 2020, being the highest in 2019. In 2013 and 2014 there was no gap between Poland and EU-27 average in terms of healthy life years at birth in total population (Figure 4A). Healthy life years at birth in male population of Poland (Figure 4B) have increased from 58.3years in 2009 to 60.3years in 2020, but the gap between Poland and EU-27 average has also increased from 2.3years in 2009 to 3.2years in 2020, being the highest in 2019. The gap between Poland and EU-27 average in males was the smallest in 2013 (1.3years). Healthy life years at birth in female population of Poland (Figure 4C) have increased from 62.5 years in 2009 to 64.3years in 2020, and the gap between Poland and EU-27 average has increased from -1.2 to 0.2 (note: the red line for the gap in females is placed under 0 axis!). In the years 2009-2014 polish females were expected to live more healthy life years at birth than the average European ones . After 2014 this advantage of polish females was diminished or even reversed and 2019 the difference was the biggest to the disadvantage of Polish female population – the indicator in females was higher for EU-27 average than in Poland by 1.0 years.

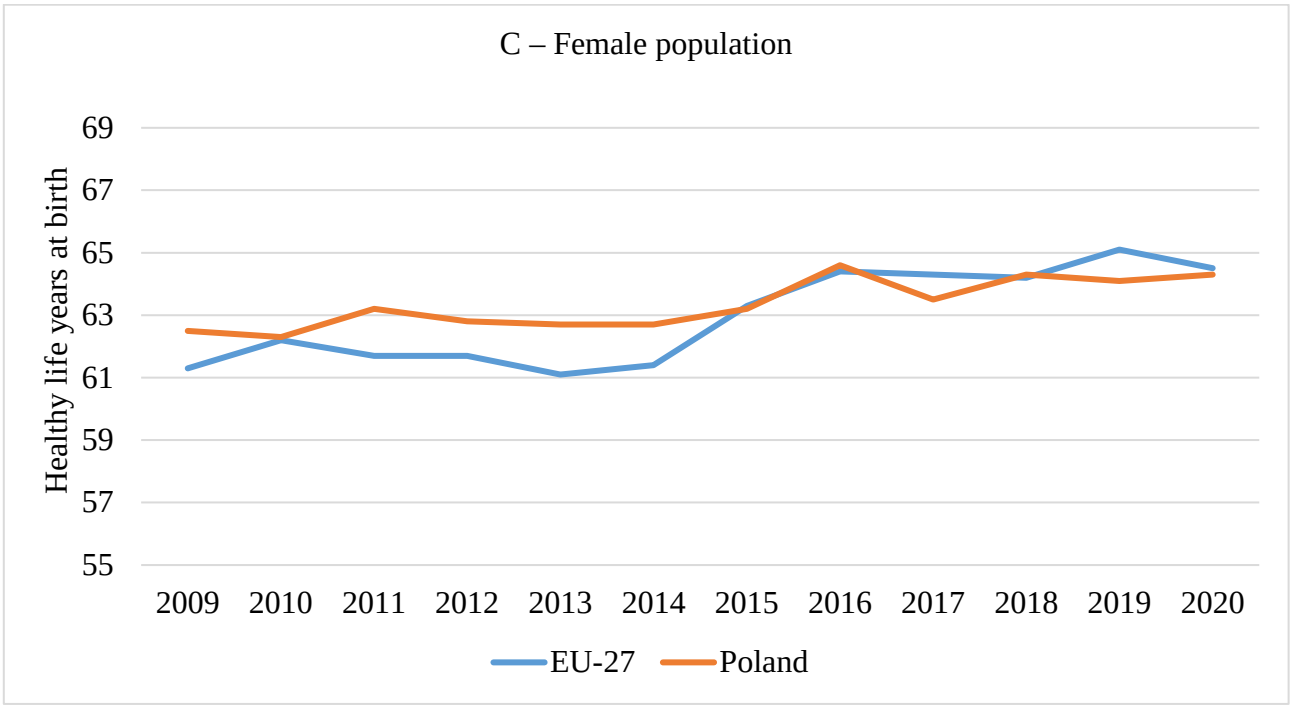
[17] Eurostat Data https://ec.europa.eu/eurostat/databrowser/view/tps00150/default/line?lang=en (accessed 15.08.2022).

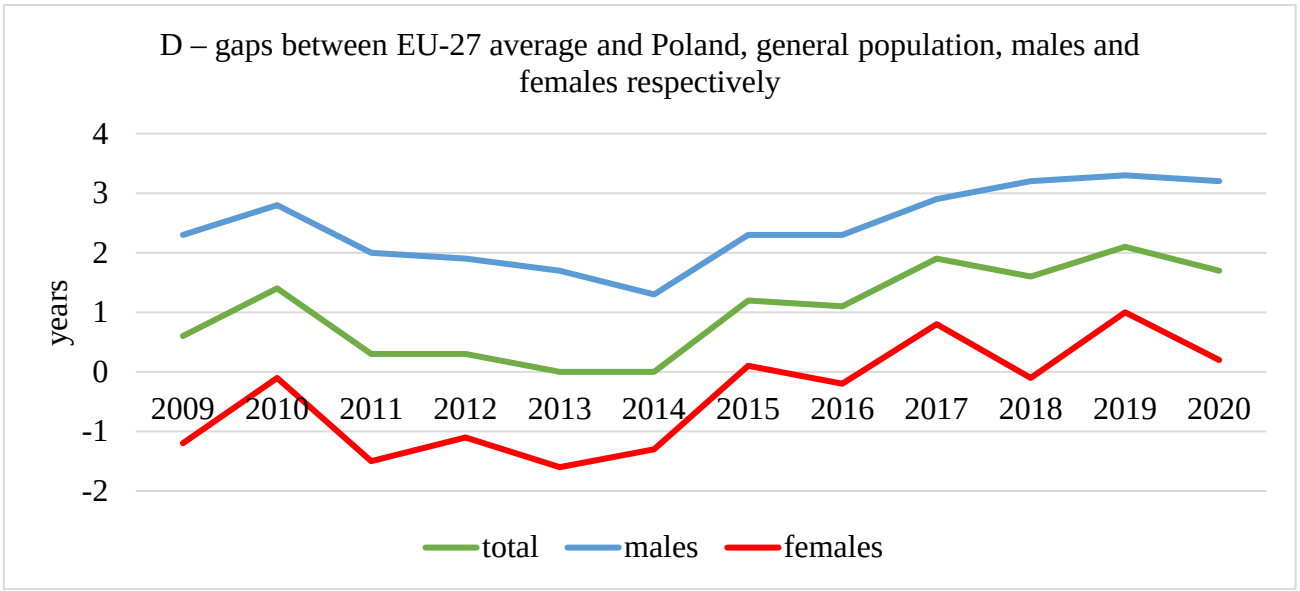
It should be noted that the gap between EU-27 average, and Poland (Figure 4D) is steadily advantageous for Polish female population and disadvantageous for Polish male population (3.2 years in 2020) in comparison with their European counterparts. Nevertheless, from 2014 the general populations healthy life years trend shows a divergence between EU-27 and Poland (the gap is growing to 1.7 years in 2020).

Figure 4. Healthy life years at birth in Poland and the EU-27 average, general population (A), males (B), and females (C). The gaps (D) between Poland and EU-27 in the general population, males and females (2009-2020)







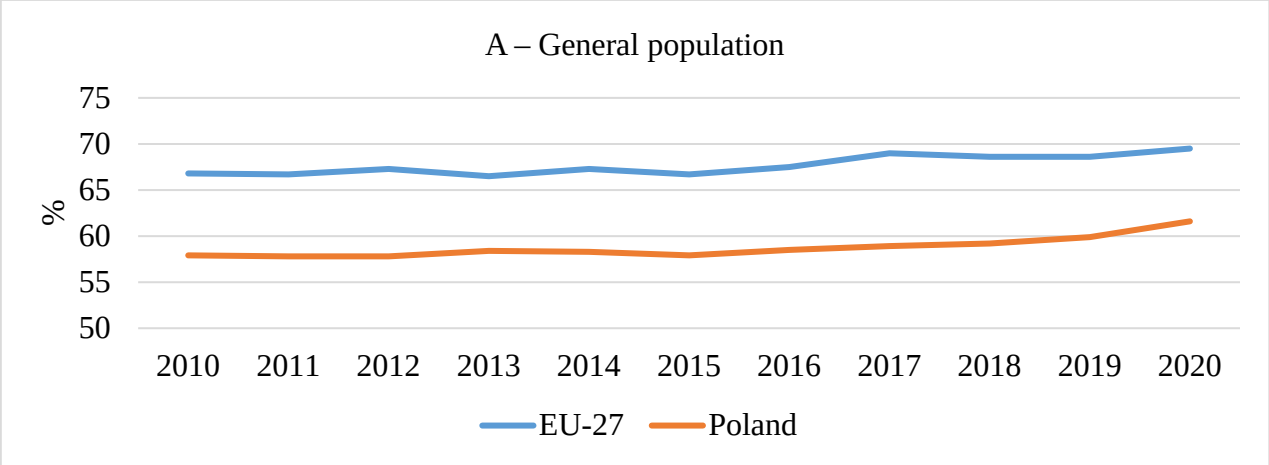


Source: Eurostat

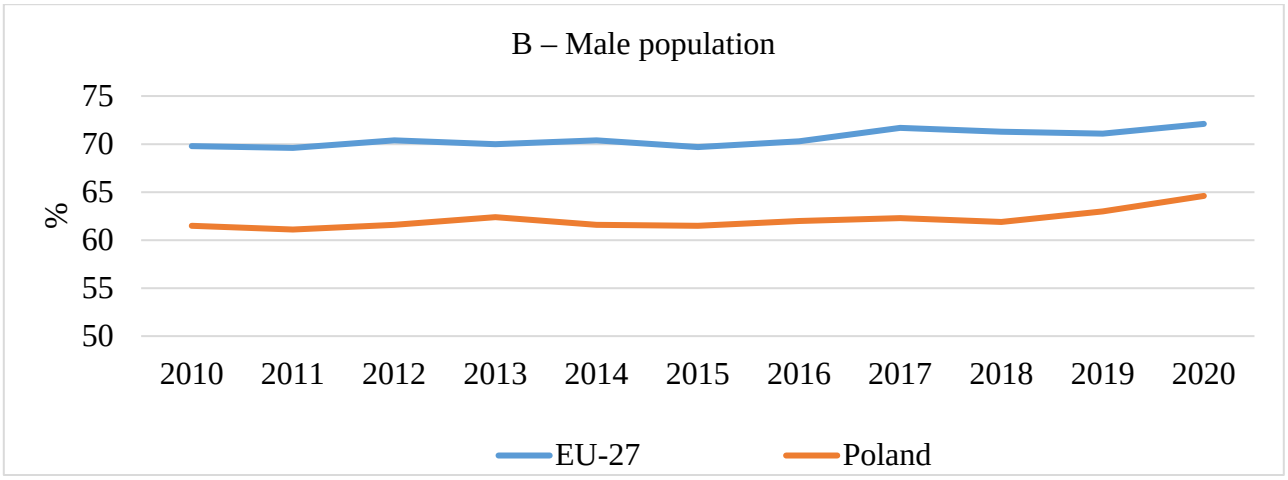
7.4. Share of people with good and very good health[18]

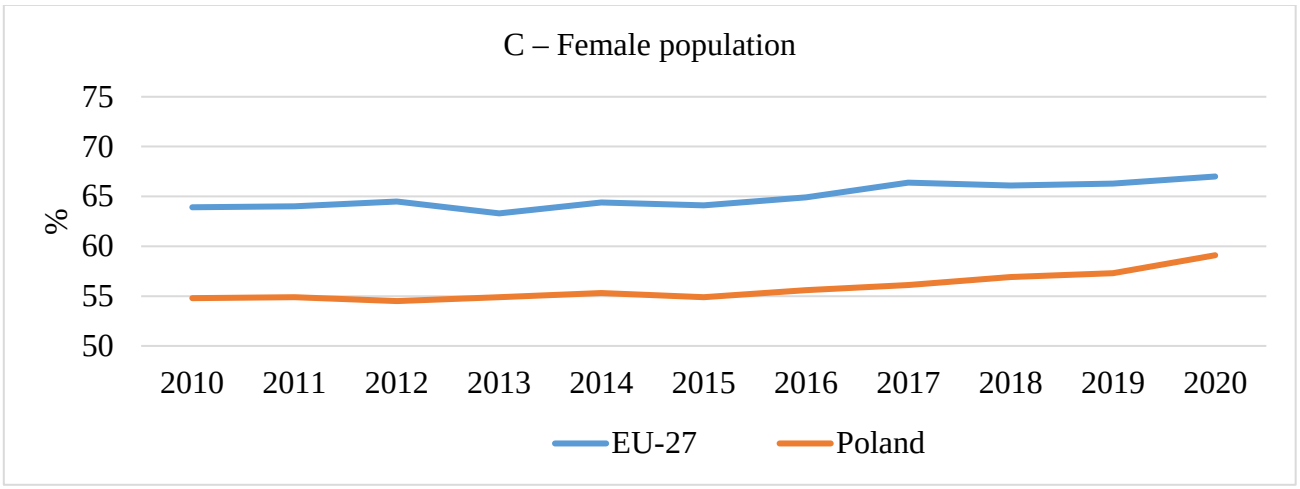
Share of the total population with good and very good self-perceived health in EU-27 has increased from 66.8% in 2010 to 69.5% in 2020. In Poland, during this period, this indicator has also risen from 57.9% to 61.6%. The gap between Poland and EU-27 average has decreased from 8.9 percentage points in 2010 to 7.9 percentage points in 2020 (Figure 5A). Average share of males with good and very good perceived health (Figure 5B) in EU-27 has increased from 69.8% in 2010 to 72.1% in 2020. In Poland, this share has also grown from 61.5% in 2010 to 64.6% in 2020. Due to these changes, the gap between the share of males in good and very good perceived health between EU-27 average and Poland has decreased from 2010 (8.3 percentage points) to 2020 (7.5 percentage points) by 0.8 percentage points. The average share of females with good and very good perceived health in EU-27 (Figure 5C) has increased from 63.9% in 2010 to 67.0% in 2020. In Poland, it has also increased from 54.8% in 2010 to 59.1% in 2020. The gap between EU-27 average, and Poland has decreased from 9.1 percentage points in 2010 to 7.9 percentage points in 2020 (Figure 5D). However, it is noteworthy that while Polish women are longer healthy than their EU-27 average counterparts, as depicted by the indicator of healthy live years,(Figure 4D) they perceive their health worse; Polish men in opposite – they perceive their health better than statistical indexes show.

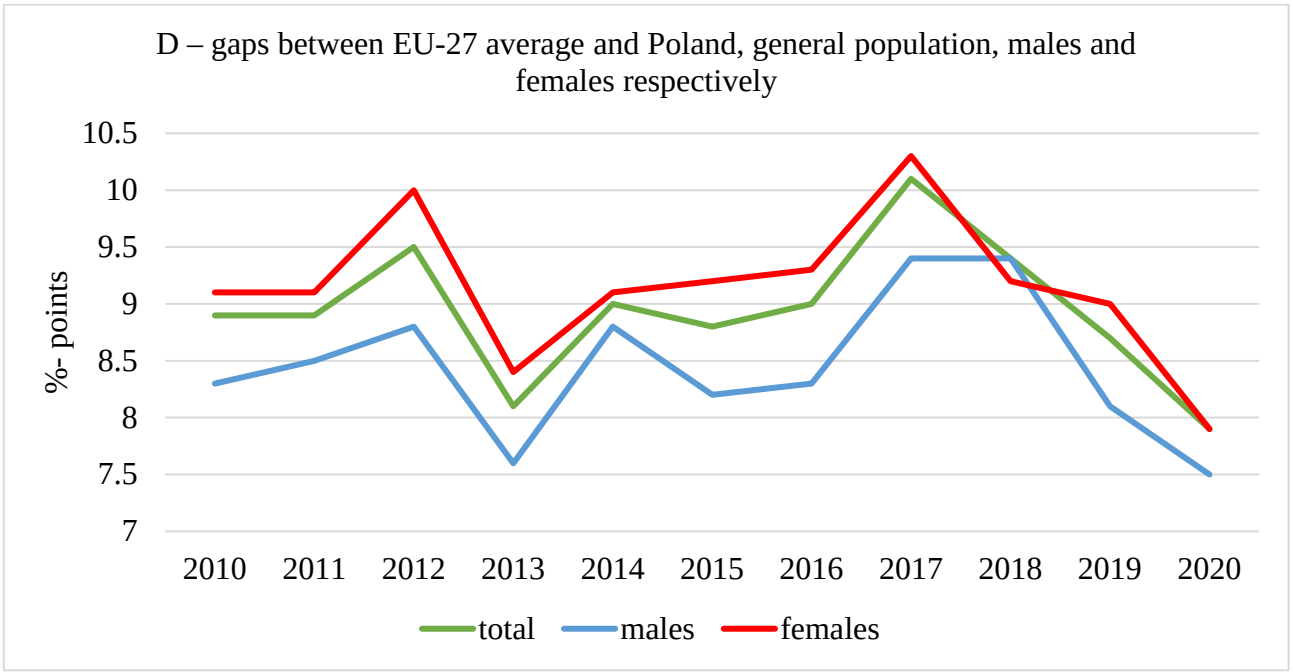
Figure 5. Share of people with good or very good perceived health in Poland and the EU-27 average, general population (A), males (B), and females (C). The gaps (D) between Poland and EU-27 in the general population, males and females (2010-2020)



[18] Eurostat data https://ec.europa.eu/eurostat/databrowser/view/sdg_03_20/default/table?lang=en (accessed 17.08.2022)





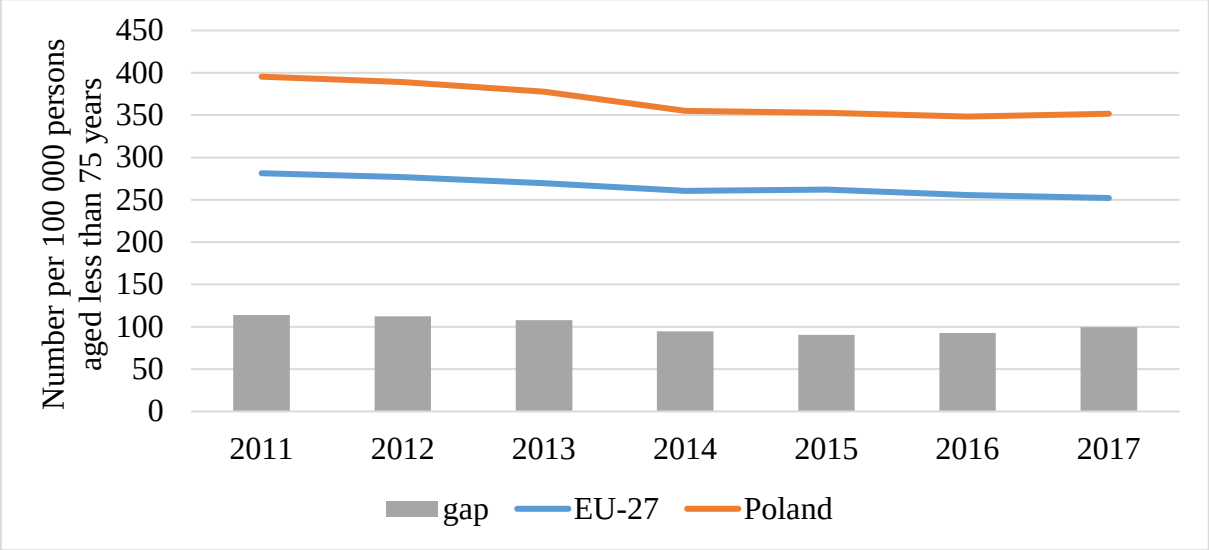


Source: Eurostat Health data

7.5. Standardized preventable and treatable mortality[19]

Standardized preventable and treatable mortality, refers to mortality (number of deaths of persons less than 75 years) that can mainly be avoided through effective public health and primary prevention interventions or through timely and effective health care interventions, including secondary prevention and treatment and is a measure of incompetence of the health care system. The gap between EU-27 and Poland 's standardized preventable and treatable mortality has decreased – from 114.05 (deaths per 100.000 persons aged less than 75 years)[20] in 2011 to 99.38 (deaths per 100.000 persons aged less than 75 years) in 2017 (with the death rate being higher in Poland than in the average of EU for both years). The total avoidable mortality refers to a number of infectious diseases, several types of cancers, endocrine and metabolic diseases, as well as some diseases of the nervous, circulatory, respiratory, digestive, genitourinary systems, some diseases related to pregnancy, childbirth and the perinatal period, a number of congenital malformations, adverse effects of medical and surgical care, a list of injuries and alcohol and drug related disorders. The smallest gap between Poland and EU-27 average was in 2014 (90.43) (Figure 6).

Figure 6. Standardized preventable and treatable mortality in EU-27 and Poland (2011-2017)



Source: Eurostat health data

[19] Eurostat data https://ec.europa.eu/eurostat/web/health/data/main-tables?p_p_id=NavTreeportletprod_WAR_NavTreeportletprod_INSTANCE_B99ImKmSwIp9&p_p_lifecycle=0&p_p_state=normal&p_p_mode=view (accessed 15.08.2022)

[20] These data are presented as standardized death rates, meaning they are adjusted to a standard age distribution to measure death rates independently of different age structures of populations. The standardized death rates used here are calculated based on the standard European population.

7.6. Chronic diseases[21]

Based on the data from the Central Statistical Office in Poland, in 2019, almost half of the responders experienced long-term health problems or chronic diseases lasting at least 6 months (by 3 percentage points less than in 2014). It is worth emphasizing that the occurrence of specific diseases is strongly dependent on the age of the respondents. The exception is allergy, which affected all age groups to a similar degree – from almost 8% in the 40-49 age group to almost 11% in the 70-79 age group. It was also the most frequently indicated ailment in people up to 29 years of age and it concerned 9% of people in this age group.

In 2019, the most common chronic diseases and conditions affecting adults (at least 15 years of age) were: high blood pressure (almost 27%) and lower back pain or other chronic back problems (almost 26%), and in children – various types of allergies (nearly 14%). Also, over 38% of adult Poles are overweight, and nearly 19% are obese, which gives almost 57% of people with excess body weight, which is over 3% more than in 2014. In 2019 about 40% of the Polish population had a normal weight.[22]

In 2019, 39% of Polish adults reported having at least one chronic condition – a slightly higher proportion than across the EU-27 (36%). This proportion increases to 70% for people aged over 65 in Poland. Many of these chronic conditions could increase the risk of severe complications from COVID-19. There is also a gap in the prevalence of chronic conditions by income group: 47% of Polish adults in the lowest income group report having at least one chronic condition, compared with 32% of those in the highest.[23]

[21] Central Statistical Office in Poland. Główny Urząd Statystyczny, Departament Badań Społecznych, Warszawa 2021. Stan zdrowia ludności Polski w 2019 r. – on the base of European Health Interview Survey – EHIS
[22] Poland Country Health Profile 2021 https://eurohealthobservatory.who.int/publications/m/poland-country-health-profile-2021 (accessed 15.08.2022)
[23] Ibidem

7.7. Main causes of death[24]

Main causes of death in Poland in 2017 (the last year with avalableEU-27 data) were:

- cancer (standardized death rates (SDR) for Poland in 2017 – 290.51, the gap to EU-27 is 38.04),
- ischemic heart disease (SDR in 2017 – 103.74; gap to EU-27 is 25.60),
- pneumonia (SDR in 2017 – 51.48; gap to EU-27 is 27.15).

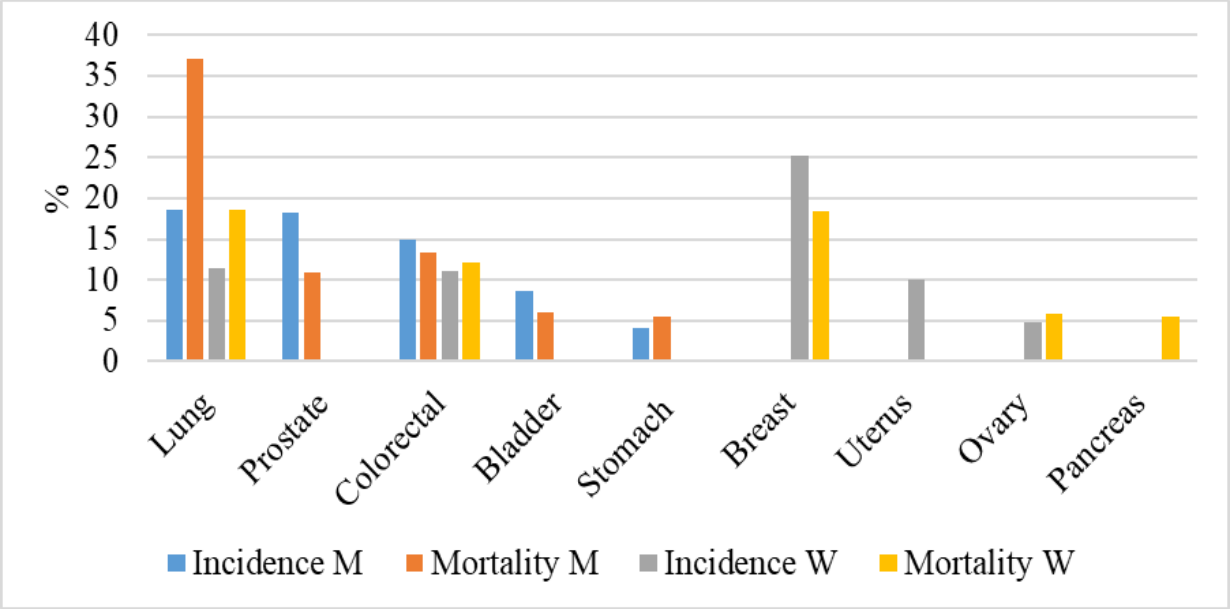
However, the gaps in terms of SDR for these causes of deaths between Poland and EU-27 have been rather waving than decreasing in time.

7.8. Cancer[25]

The gap between death rates due to cancer between Poland and EU-27 average is increasing – from 29.54 in 2011 to 38.04 in 2019, although both, Polish and European rates, are decreasing (from 297.4 to 290.5, and from 267.9 to 252.5, respectively). Meaning, that death rate due to cancer is decreasing through the years but the EU as average has made more progress in beating cancer than Poland. Although, the overall cancer incidence rates for both men and women are lower than the EU-27 averages, the mortality rates are 30 percentage points higher for men and 25 percentage points higher for women, indicating problems with timely diagnose and treatment.[26] In terms of incidence,[27] the most prominent types of cancer are: lung (18.5%), prostate (18.3%), colorectal cancer (15.0 %), bladder (8.6%), and stomach (4.1%) across male in 2020 in Poland. While ,at the same period it was breast (25.3%), lung (11.5%), colorectum (11.0%), uterus (10.1%) and ovary (4.8%) for female (Figure 7).

[24] Eurostat data. https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Causes_of_death_statistics#Major_causes_of_death_in_the_EU_in_2017 (accessed 1.08.2022)
[25] Eurostat data. https://ec.europa.eu/eurostat/web/health/data/main-tables?p_p_id=NavTreeportletprod_WAR_NavTreeportletprod_INSTANCE_B99ImKmSwIp9&p_p_lifecycle=0&p_p_state=normal&p_p_mode=view (accessed 15.08.2022)
[26] Poland Country Health Profile 2021 https://eurohealthobservatory.who.int/publications/m/poland-country-health-profile-2021 (accessed 15.08.2022)
[27] European Cancer Information System https://ecis.jrc.ec.europa.eu/explorer.php?$0-0$1-All$2-All$4-1,2$3-0$6-0,85$5-2020,2020$7-7$CEstByCountry$X0_8-3$X0_19-AE27$X0_20-No$CEstBySexByCountry$X1_8-3$X1_19-AE27$X1_-1-1$CEstByIndiByCountry$X2_8-3$X2_19-AE27$X2_20-No$CEstRelative$X3_8-3$X3_9-AE27$X3_19-AE27$CEstByCountryTable$X4_19-AE27 (accessed 17.08.2022)

Figure 7. The most frequent cancers due to incidence and mortality in Poland in 2020 (M – men; W – women) as a percentage of total cancer cases

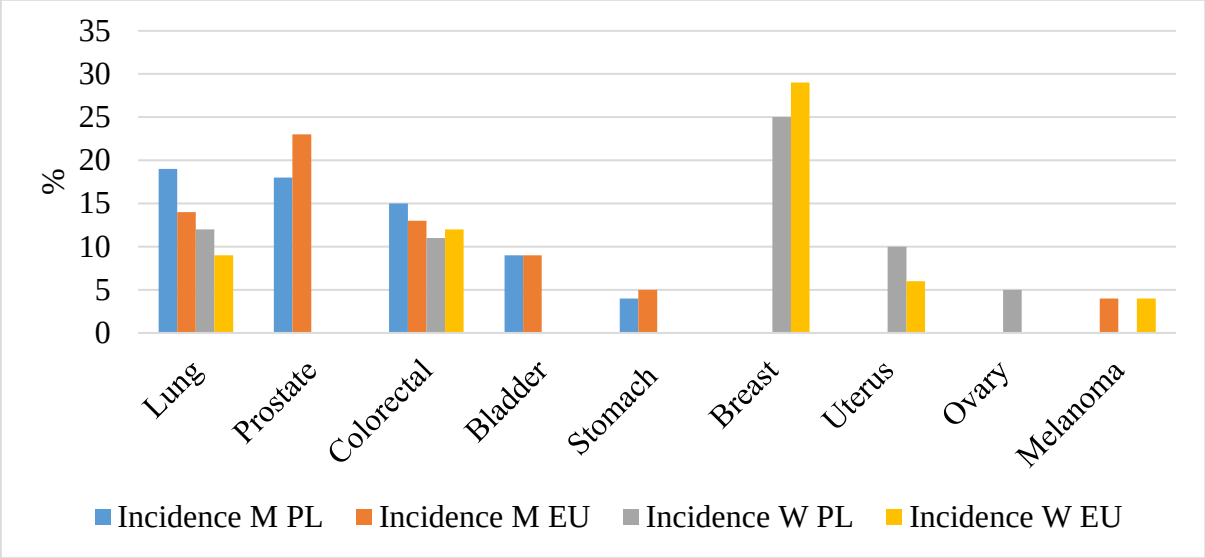


Source: Eurostat health data

In Poland in 2020 there were 97465 cases of cancer in women, and over 1000 cases more in men (98975 cases). In terms of mortality, among both women and men, the highest rate was for lung cancer (18.6% and 37.0%, respectively). In 2020 among men there were 64748 cancer deaths, next after lung cancer was colorectal cancer (13.3%), prostate (10.9%), bladder (6.0%) and stomach (5.5%) cancers. 53 561 Polish women have died in 2020 due to cancer, among them second the most frequent cancer was breast (18.4%), then colorectum (12.2%), ovary (5.8%) and pancreas (5.5%) cancers.

In EU-27 the share of lung cancer in men, from the total of cancer cases, is lower than the corresponding in Poland (14.2%), but the share of prostate one is higher (23.2%). Share of new cases of colorectal cancer is lower for men (13.2%), but higher in women (12.2%). The fifth most common cancer in EU-27 is melanoma for both men (3.8%) and women (4.1%) (Figure 8).

Figure 8. The incidence of the most frequent cancers in men and women in Poland and EU-27 in 2020

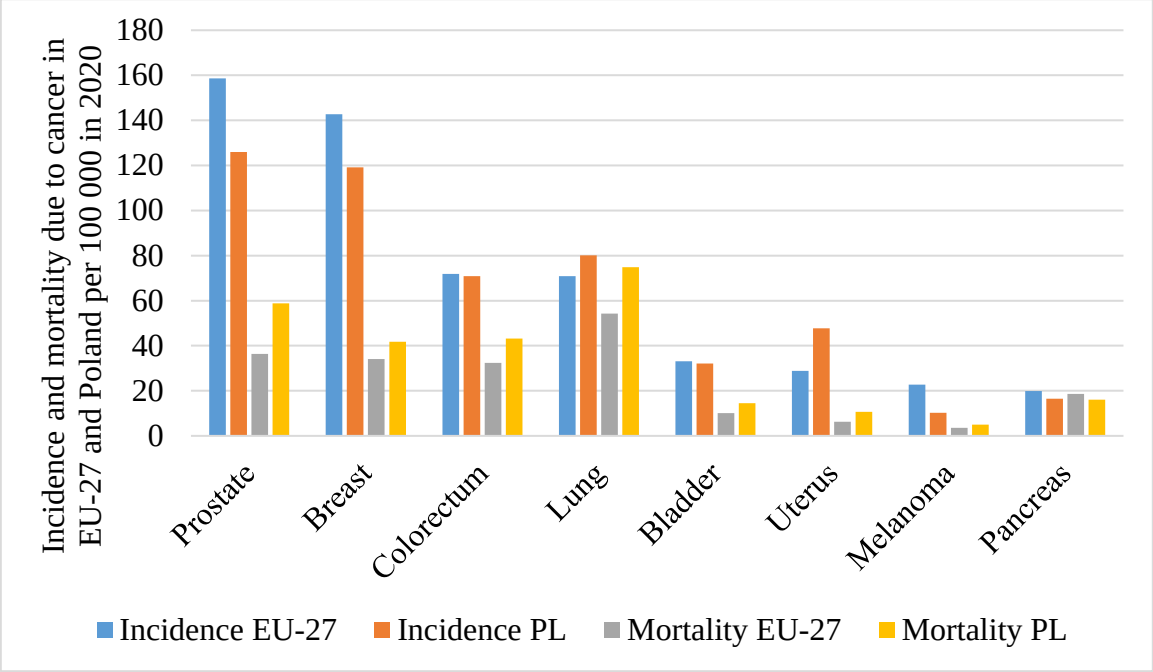


Source: Eurostat health data

As presented on Figure 9 and Figure 10, the most common cancers in 2020, the incidence of prostate, breast, and colorectal cancers was higher in EU average than in Poland. The difference in incidence was more for prostate and breast cancer (32.7 and 23.7, respectively). At the same time, the gap in mortality between Poland and EU average was also highest in the case of prostate cancer– there were 22.5 deaths per 100 000 due to this cancer more in Poland than EU-27 average. Gap between breast cancer mortality in EU-27 and Poland is also big – there were 7.7 per 100 000 cases more in Poland than EU-27 average. For colorectal cancer the incidence is similar (71.8 and 70.9 for EU-27 and Poland, respectively). Incidence of melanoma was higher as EU-27 average than for Poland by 12.5 cases per 100 000, but mortality was higher for Poland – by 1.5 deaths per 100 000. Incidence of lung and uterus cancers were higher in Poland than in EU-27, the differences were 9.2 and 18.9, respectively. Mortality rates in both types were also bigger in Poland– 20.6 and 4.4, respectively. The big difference in the incidence of lung cancer could be attributed to poor air quality and greater prevalence of smoking[28] in Poland compared to average for EU-27.

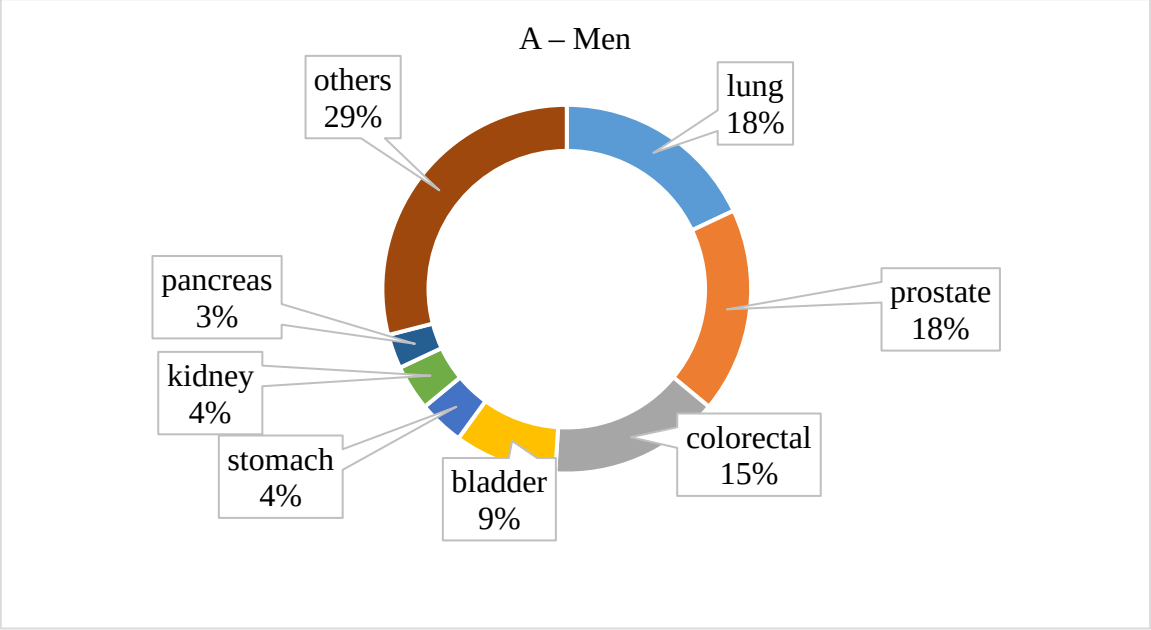
Figure 9. Incidence and mortality due to cancer in EU-27 and Poland per 100 000 in 2020

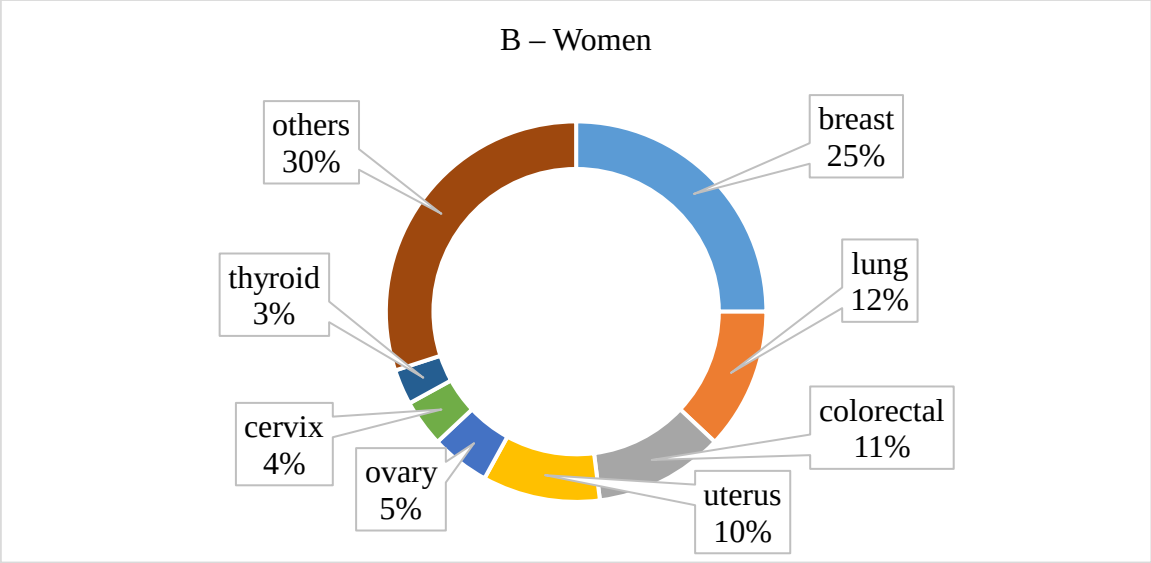
[28] Poland Country Health Profile 2021 https://eurohealthobservatory.who.int/publications/m/poland-country-health-profile-2021 (accessed 15.08.2022)



Source: Eurostat

Figure 10. Cancer sites in Polish men (A) and women (B) in 2020





Source: ECIS – European Cancer Information System

7.9. The health effects of COVID-19 pandemics

Our study showed that COVID-19 pandemic had a significant impact on health effects in Poland resulting in shortening of life expectancy at birth (which was decreased by 1.4 years between 2019 and 2020 while at the same time life expectancy decrease in EU. (EU-27 average was 0.7 years.). Meanwhile, healthy life years at birth in the total population decreased between 2019 and 2020 by 0.2 years in Poland (while in EU-27 average 0.6 years.).As for Poland, sex analysis revealed a decrease by 0.6 y ears in male population (EU-27 0.7 years respectively) and a paradox increase by 0.2 y. in females (EU-27 0.6 y decrease).

However, the pandemics did not affect the self-perceived health. Shares of peoples with good or very good perceived health in Poland and the EU-27 have increased. The gap between PL and EU-27 have decreased (showing a convergence trend). Percentage of people with self-reported unmet needs for medical care in Poland decreased by 2.3%-points between 2019-2020; while at the same time, the level of self-reported unmet needs for medical care in EU-27 has increased by 0.2%-points to 1.9%. Thus**, the gap between PL and EU-27 in 2020 was zero**. The shares of people with self-reported unmet needs for medical examination presented similar trends in 2019-2020 decreasing in 2020 to the EU-27 levels. Some evidence of the impact of COVID-19 pandemic on Polish health outcomes can be found in external studies. According to Islam et al. study[29] covering 29 OECD countries from and outside the EU and basing on the data from the Human Mortality Database,[30] Poland was the fifth country (after US, Italy, England & Wales, and Spain) with the highest absolute number of excess deaths: 60 100 (95%CI 58 800 to 61 300) and second country with the highest excess death rates (per 100 000) in men (after Lithuania): 191 (95%CI 184 to 197) in 2020. In the next Islam et al. study[31] that included 12 more OECD countries from and outside the EU, with data again taken from the Human Mortality Database. Poland was not among six countries with the highest reduction in life expectancy but was the fifth country with the highest excess of years of life lost per 100 000 population (after Bulgaria, Russia, Lithuania, and US): in men 3830 (95%CI 3540 to 4120) and in women 1830 (95%CI 1630 to 2040).

[29] Islam N, Shkolnikov VM, Acosta RJ et al. Excess deaths associated with covid-19 pandemic in 2020: age and sex disaggregated time series analysis in 29 high income countries. BMJ 2021;373:n1137 doi.org/10.1136/bmj.n1137
[30] the Human Mortality Database collates mortality and population data from authoritative national agencies and is maintained by the Department of Demography at the University of California, Berkeley, USA, and the Max Planck Institute for Demographic Research in Rostock, Germany.
[31] Islam N, Jdanov DA, Shkolnikov VM et al. Effects of covid-19 pandemic on life expectancy and premature mortality in 2020: time series analysis in 37 countries. BMJ 2021;375:e066768 doi.org/10.1136/bmj-2021-066768

7.10. Health outcomes – main conclusions

- **A big effort has been undertaken by the Polish Health authorities to improve the health status of the population and to diminish the gap between PL and the EU-27.**
- **Life expectancy increased in Poland from 67,7 years in 1960 to 77.9 years in 2019. This indicates a health gain of 10.2 years . The corresponding health gain in the EU-27 Average was 12.6 years**
- **The gap in life expectancy at birth between PL and EU-27 has increased from 1,3 years in 1960 to 3.2 years in 2019. During the COVID-19 pandemic (2019 to 2020) this gap increased to 4.5 years**
- **The indicator of Healthy life years at birth, has been waving specifically for female population being timely better than that of the EU-27 average (the gap <0) reaching 0.2 years in 2020. However, for the male population it is steadily lower than that of the EU-27 average with the gap reaching 3.2 years. in 2020. In total population, the gap in 2020 was 1.7 years. The gender gap (the difference between men and women) in healthy life years at birth hardly falls below 3 years at any time. Thus, the gap in healthy life years is 1.7 due to gender gap.**
- **The gap between PL and EU-27 in standardized preventable and treatable mortality was the smallest in 2014 (90.4), and have been rising up to 99.4 in 2017 revealing issues with prevention and treatment in Poland.**
- **Shares of population perceiving their health as good or very good have been rising in Poland a bit quicker than EU-27 average, so the gap was decreasing to 7.9 percentage points (7.5 percentage points in males and 7.9 percentage points in females) in 2020. However, it is interesting to observe the gaps between PL and EU-27 in the general population and separately by sex to find out that Polish women assess their health more critically than the EU-27 ones although it may be in fact better (as discussed above). Polish men assess their health closely their European counterparts.**
- **In terms of oncological diseases, in 2020 the incidence per 100.000 was higher in EU-27 average than in Poland with the biggest differences reported for prostate and breast cancer (32.7 and 23.7, respectively. At the same time, the gap in mortality between Poland**

and EU-27 average was 22.5 deaths per 100 000 for prostate cancer , and 7.7 per 100.000 for breast cancer (with Poland having the higher mortality in both cancers).

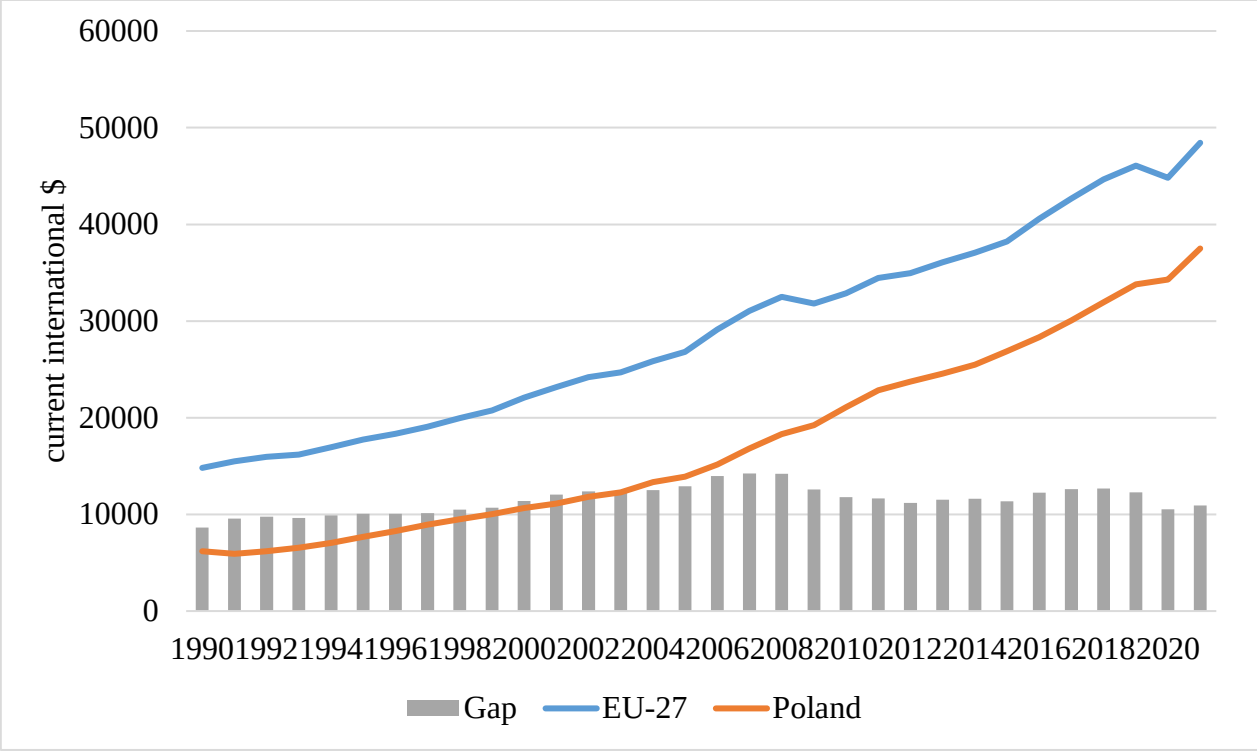
- **During the COVID-19 pandemics (2019-2020) life expectancy in Poland has been reduced by 1.4 years, twice as much as measured in the EU-27 average. Healthy life years at birth have been reduced in the total population and in males but not in females. Poland was in a group of countries with the highest absolute number of excess deaths, specifically in males and among the countries with the highest excess of years of life lost per 100.000 population. However, self-reported health maintained good or very good in the increasing shares of population and self-reported unmet needs have been reduced to EU-27 levels.**

8. GDP per capita[32]

The gap between Poland and EU-27 average, in terms of gross domestic product (GDP) per capita was growing between 2004 and 2008 and then waving, but never exceeded the highest value of 2008 (14189 PPP/USD) (Figure 11). When Poland joined the EU in 2004, the difference in GDP per capita was 12.511 USD, with the smallest gap seen in 2015 (11.360 USD). In 2020 the gap reached about 10.500 USD. But converging to the average value of GDP per capita of EU-27. Poland is moving in a good direction – GDP per capita in Poland grew from13.354 USD in 2004 to 34.300 USD in 2020, while in 2020 average GDP per capita for EU-27 was 44.800 USD.

As GDP per capita in both PL and EU-27 is steadily growing, the gap between them is similar in the period 2010-2020 (with a small decrease in 2019).

Figure 11. GDP per capita, PPP in Poland and EU-27 (current international USD)



Source: World Bank

[32] World Bank data https://data.worldbank.org/indicator/NY.GDP.PCAP.CD?locations=Z7&view=chart (accessed 27.08.2022)

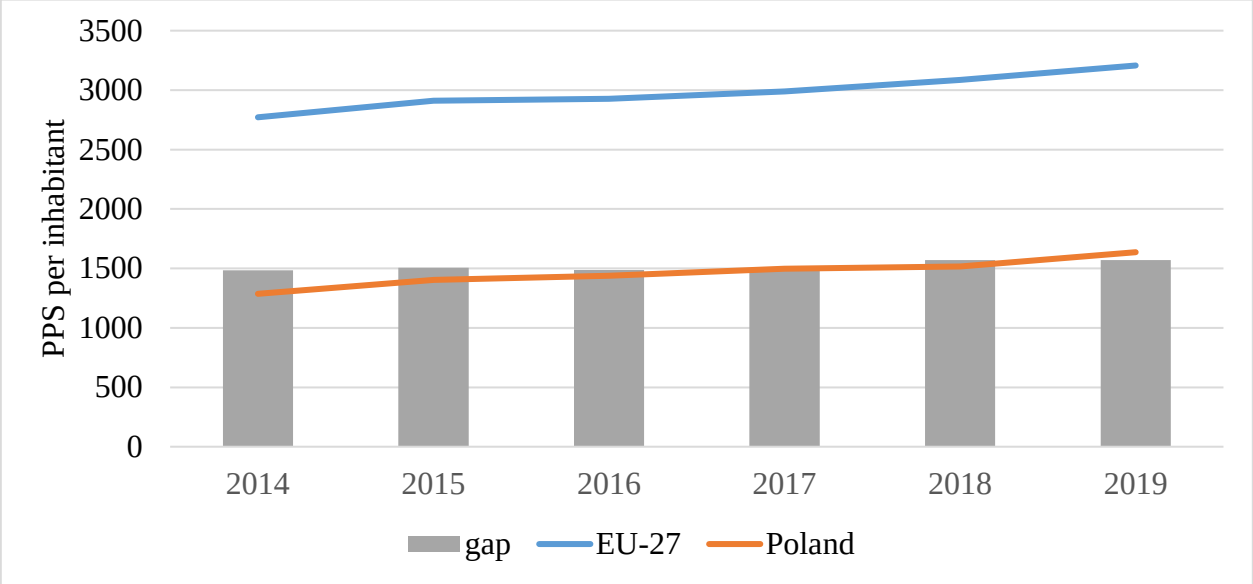
9. Health expenditure in Poland

The next step of our assessment of the health care system performance in Poland, focus on the analysis of health expenditures in Poland in relation to the average of EU-27 .

9.1. Total health expenditures

According to the National Health Bill for 2019[33] all health expenditures in Poland counts for 147,838.5 million PLN (that stands for 34,400.25 million euro by Eurostat[34]). The changes in total health expenditures in the years 2014-2019 (expressed per purchasing power standard (PPS) per capita) can be seen at the Figure 12. More detailed analysis, that follows in our assessment, that includes shares of spending, should be examined in the context of much lower health care spending in Poland compared with the EU-27 average: the gap in spending has been almost unchanged since 2014 and the total expenditure per citizen counts for a half of EU-27 average.

Figure 12. Health expenditure, total, purchasing power standard (PPS) per inhabitant, EU-27 average vs Poland (2014-2019)[35]

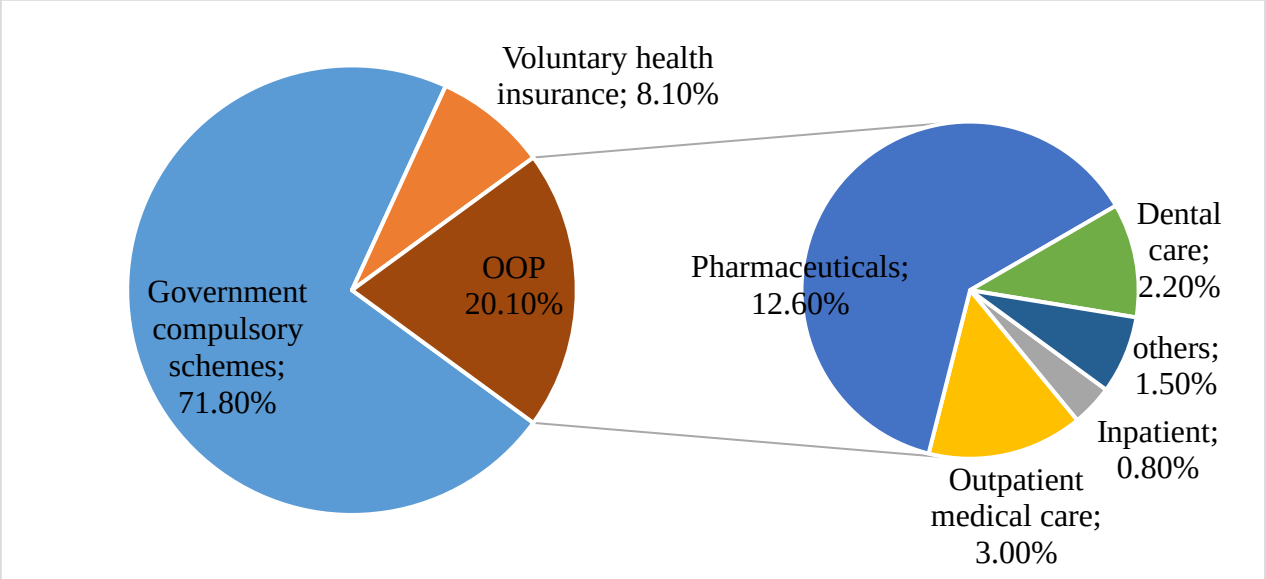


Source: Eurostat

[33] Statistics Poland https://stat.gov.pl/sygnalne/komunikaty-i-obwieszczenia/lista-komunikatow-i-obwieszczen/obwieszczenie-w-sprawie-narodowego-rachunku-zdrowia-za-2019-rok,283,8.html (access 10.08.2022)
[34] Eurostat https://ec.europa.eu/eurostat/databrowser/view/hlth_sha11_hc/default/table?lang=en (access 10.08.2022)
[35] Eurostat https://ec.europa.eu/eurostat/databrowser/view/HLTH_SHA11_HC__custom_3263916/default/table?lang=en (access 20.08.2022)

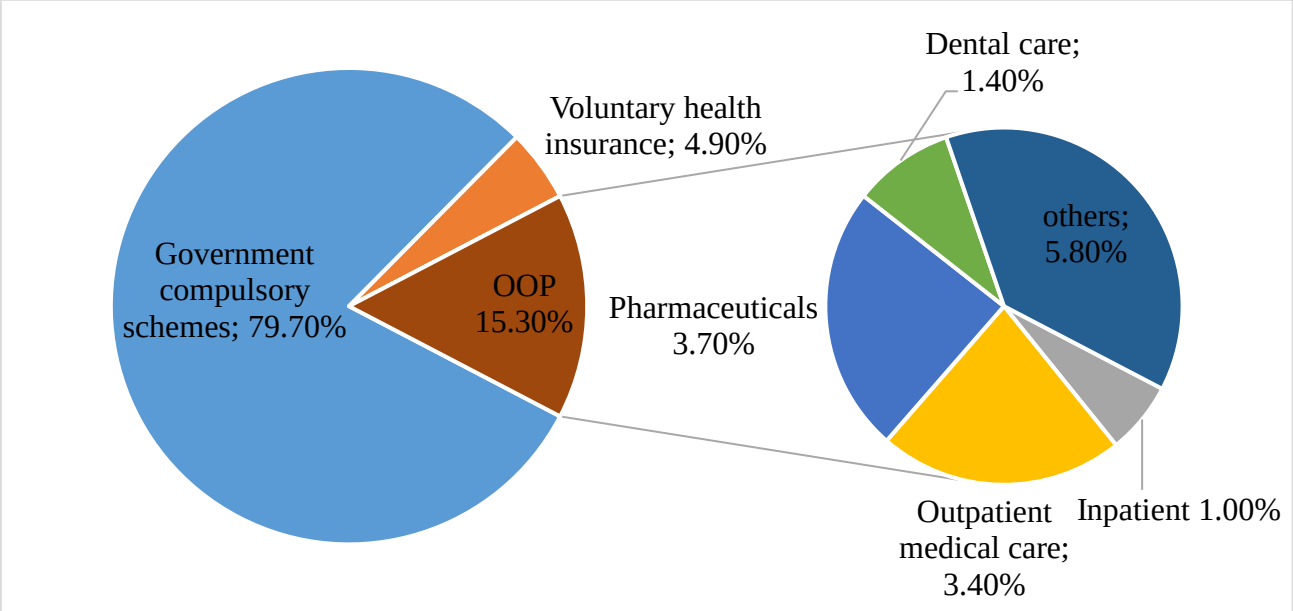
The structure of health spending in Poland and EU-27 2019 is presented at Figure 13 and Figure 14 respectively. As much as 71.8% of total health spending in Poland were public expenditures. Public funding as a proportion of total expenditure was below the EU-27 average (79.7%). Public expenditures in Poland were paid from compulsory insurance budget (86.2%) and governmental budgets (13.8%; of which general government pays 55% and local governments pay 45%). Noteworthy is the significant difference in out-of-pocket (OOP) spending as a shares of total health expenditure: 20.1% in Poland, while at the same time it was 15.3% in EU-27.

Figure 13. The structure of total health spending and of out-of-pocket health spending in Poland (2019)[36]



Source: OECD

Figure 14. The structure of total health spending and of out-of-pocket health spending for EU-27 average (2019)[37] Source: OECD

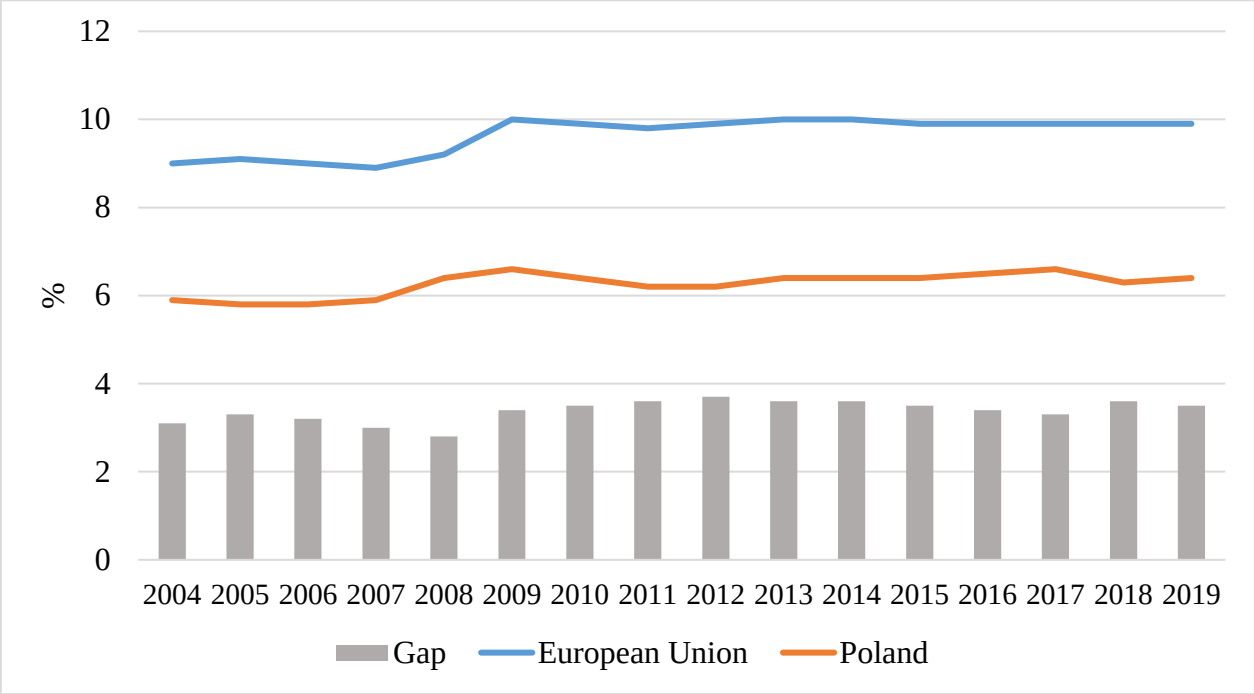


[36] Poland Country Health Profile 2021 https://eurohealthobservatory.who.int/publications/m/poland-country-health-profile-2021 (access 15.08.2022)
[37] Ibidem

9.2. Health expenditures as share of GDP. Out-of-pocket payment per capita

In terms of total health expenditures measured as percentage of GDP, since 2004 spending has grown from 5.9% in 2004 (the year when Poland joined EU) to 6.4% in 2019. The average for European Union-27 has also grown from 9.0% to 9.9%. Therefore, the gap between EU-27 and Poland has also moderately grown – from 3.1 percentage points to 3.5 percentage points[38] (Figure 15).

Figure 15. Health expenditure as share (%) of GDP, Poland and EU-27 average

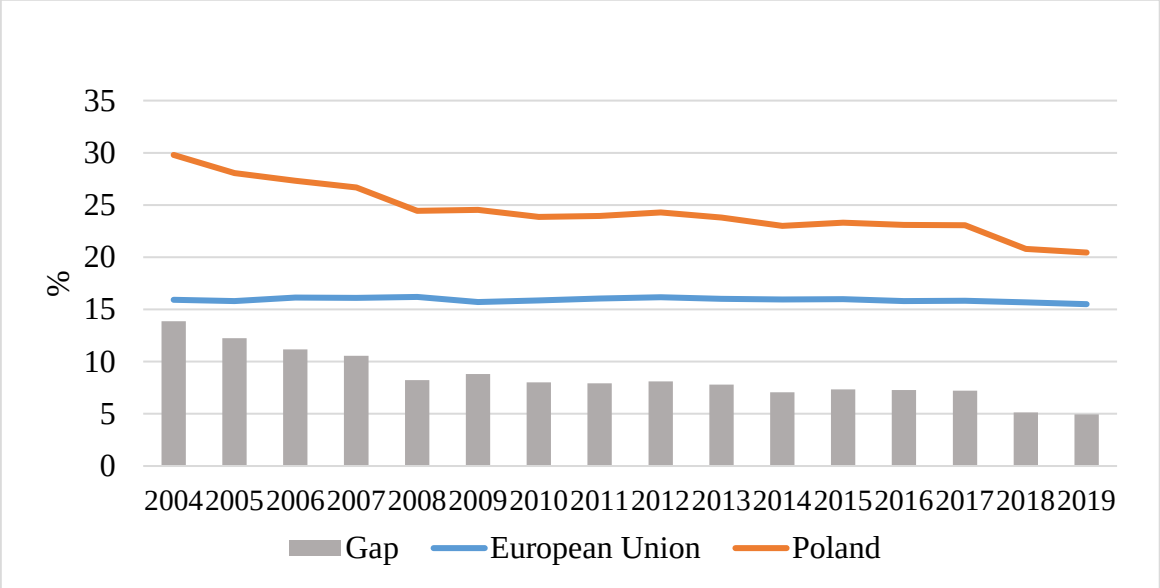


Source: World Bank

Out-of-pocket (OOP) spending of Polish citizens accounted for 20.44% in 2019, being 4.94 percentage points higher than average OOP in EU-27 (15.5%). Thus, the gap between Poland and EU-27 has been reduced, as in 2004 it was almost 3 times higher (13.86 percentage points) when OOP spending in Poland was 29.79% of the total health spending, and EU-27 average was 15.93%.[39] (Figure 16).

[38] World Bank data https://data.worldbank.org/indicator/SH.XPD.CHEX.GD.ZS?end=2019&locations=PL&start=2019&type=shaded&view=map (accessed 20.08.2022)
[39] World Bank data https://data.worldbank.org/indicator/SH.XPD.OOPC.CH.ZS?end=2019&locations=PL&start=2019&type=shaded&view=map (accessed 22.08.2022)

Figure 16. Out-of-pocket expenditure (% of current total health expenditure), Poland and EU-27 average



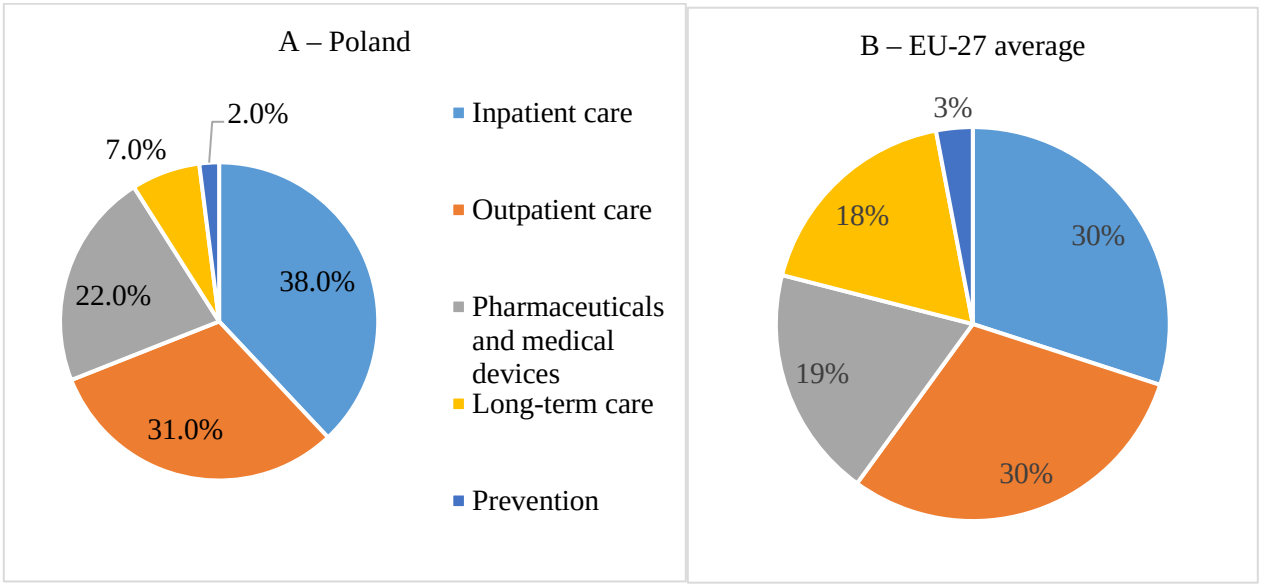
Source: World Bank

9.3. Inpatient, outpatient, long-term care expenditure

In 2019, 37% of health expenditure in Poland was spent on inpatient care – being one of the highest in the EU-27 after Romania, Greece, and Bulgaria (Figure 17)., while in EU it was only 30%. At the same time, expenditure for outpatient care was 31% of total health expenditure in Poland and 30% in EU-27. The biggest difference in shares between Poland and EU-27 average exists in expenditures for long-term care: 7% and 18% , respectively. This gap is caused by a shortage of formal long-term care facilities and services, and high reliance on informal care provided by family members in Poland.[40]

[40] Poland Country Health Profile 2021 https://eurohealthobservatory.who.int/publications/m/poland-country-health-profile-2021 (access 15.08.2022)

Figure 17. Distribution of health public expenditures in Poland (A) and EU-27 average (B) (2019)



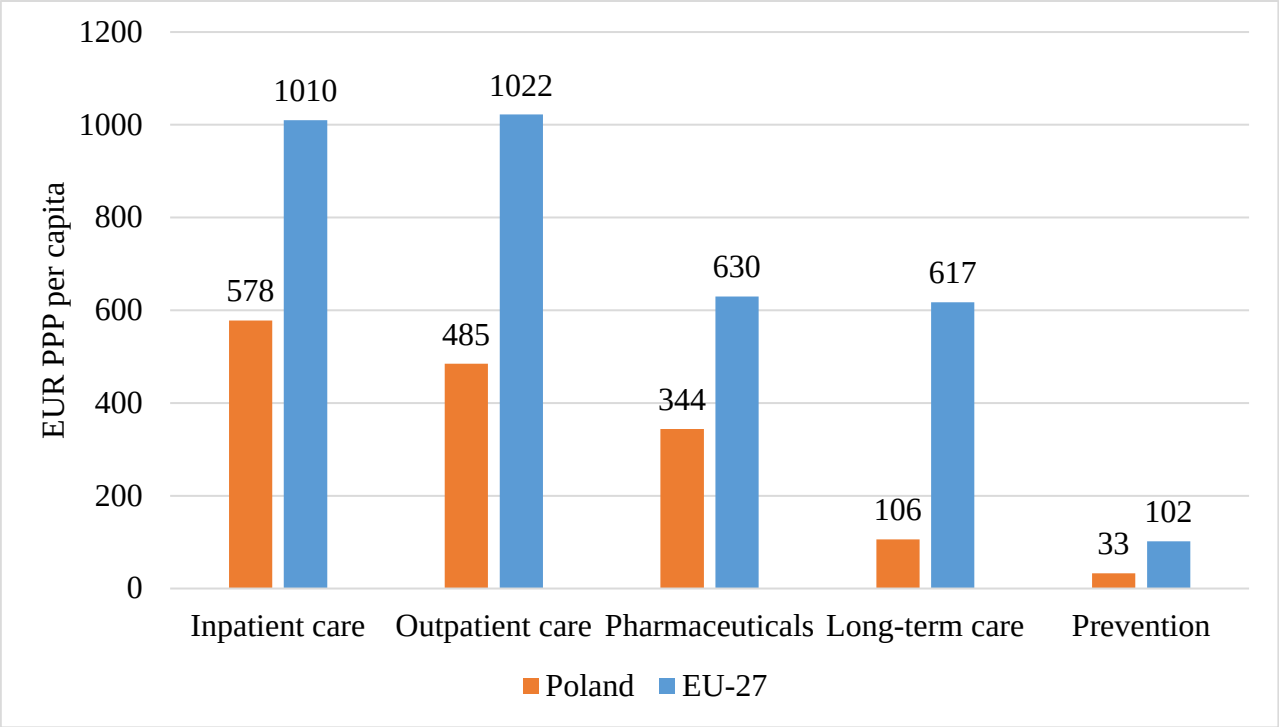
Source: OECD Health Data

On a per capita basis, spending on both inpatient and outpatient care in Poland is roughly half of the EU-27 average in 2019. Per capita spending on long-term care is also very low in Poland, 7% of current spending, compared to an EU-27 average of 18% (Figure 18).[41] The shares of public resources in the total spending for different categories also differs between Poland and EU-27average.

The public expenditures share for inpatient and dental care are higher than EU-27 average. The biggest gap is noted in pharmaceutical spending, where Poland finance 36% of the cost by public funds, while EU-27 average 57% of the cost (a difference of 21 percentage points) (Figure 19).

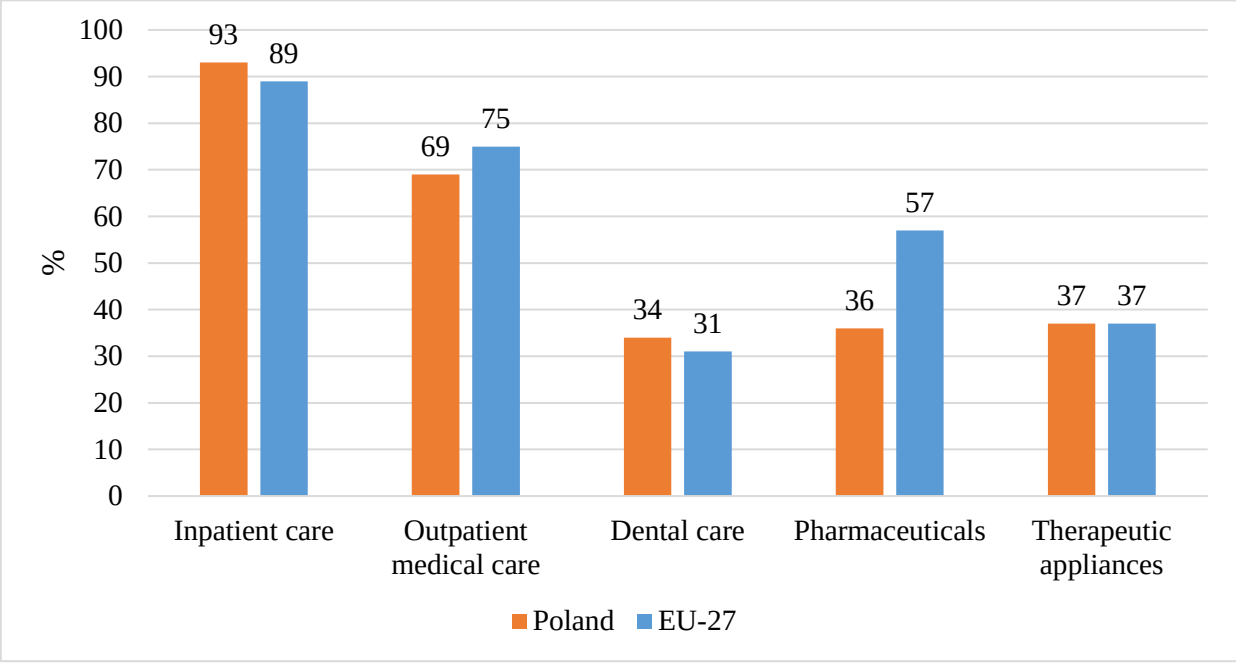
[41] Poland Country Health Profile 2021 https://eurohealthobservatory.who.int/publications/m/poland-country-health-profile-2021 (accessed 15.08.2022)

Figure 18. The values* of health public funding per capita in Poland and EU-27 (2019)



Source: OECD Note ** The total value of health public funding per capita in Poland amounts for 1 546 EUR PPP and the EU-27 average amounts for 3 381 EUR PPP.*

Figure 19. Public spending as a proportion of total spending for the individual type of service, Poland and EU-27 (2019)

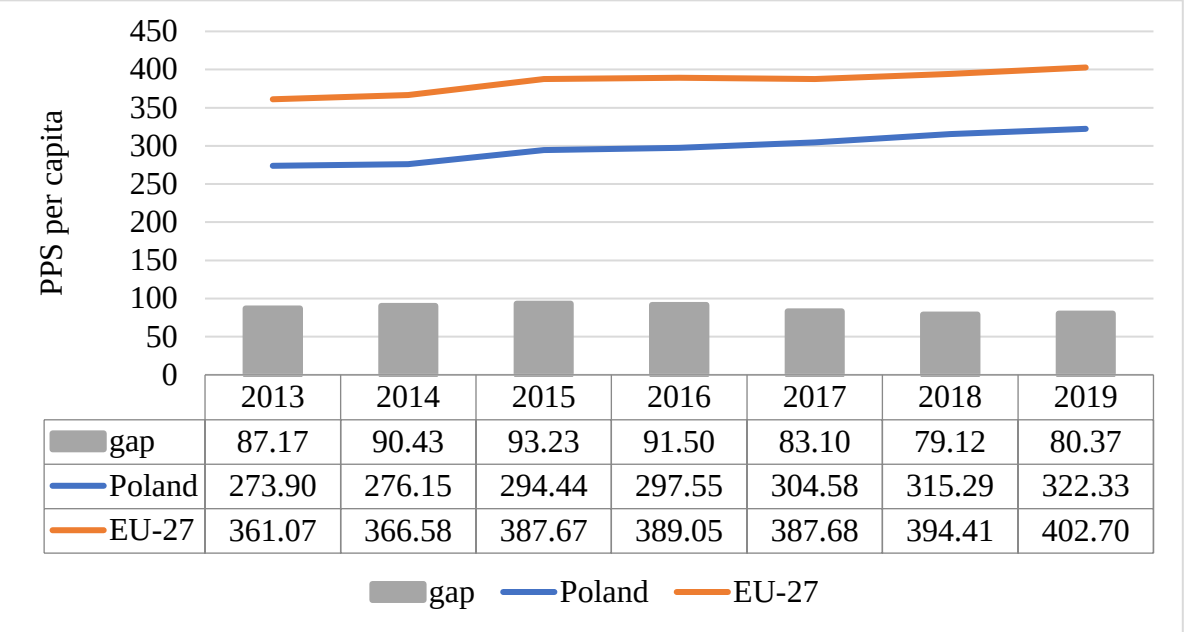


Source: OECD Health data

9.4. Pharmaceutical expenditure[42]

Total pharmaceutical expenditure per capita in Poland is extracted from the Eurostat data base. Examining the trend from 2013 to 2019 we witness an increase in Polish pharmaceutical expenditure from 274 Euros in 2013 to 322 Euros in 2019. (i.e increase by 18%). In the EU-27 average the corresponding value was 361 Euros in 2013 that grew up to 403 Euros in 2019. (i.e., increase by 12%). Comparing the rate of growth between Poland and EU-27 average, we observe a faster increase in Poland than the EU average ensuring a convergent trend. (Figure 20). The gap was also slightly decreased from 87 Euros in 2013 to 80 Euros in 2019.

Figure 20. Total pharmaceutical expenditure EU-27 average vs Poland (Purchasing Power Standard, PPS per capita)



	2013	2014	2015	2016	2017	2018	2019
gap	87.17	90.43	93.23	91.50	83.10	79.12	80.37
Poland	273.90	276.15	294.44	297.55	304.58	315.29	322.33
EU-27	361.07	366.58	387.67	389.05	387.68	394.41	402.70

Source: Eurostat Health data file

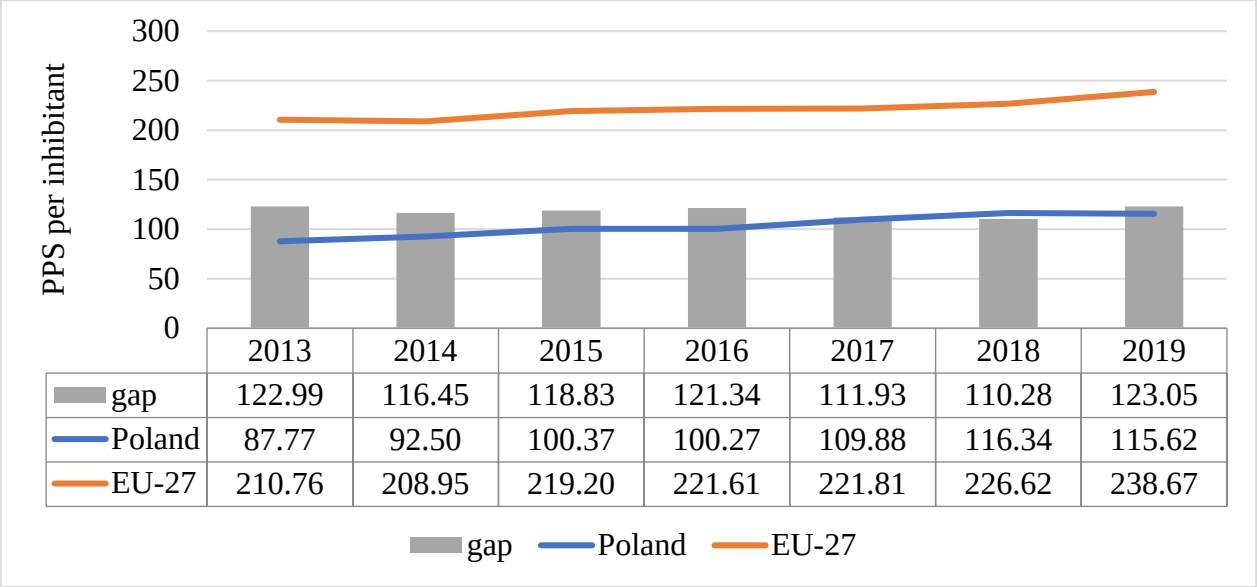
Public Pharmaceutical expenditure

Public pharmaceutical expenditure presents a similar trend with total pharmaceutical expenditure. However, we should note that the rate of increase in public pharmaceutical spending in Poland was three times higher and faster to total pharma expenditure. Examining the period 2013 to 2019, public pharmaceutical expenditure increased in Poland from 88 Euros in 2013 to 116 Euros in 2019. (i.e.

[42] Eurostat Data (access 15.08.2022).

increase by 32%). The corresponding increase in the EU average was from 211 Euros in 2013 to 239 Euros in 2019 (i.e. increase by 13%) (Figure 21).

Figure 21. Public pharmaceutical expenditure EU-27 average vs Poland (Purchasing Power Standard, PPS per capita)



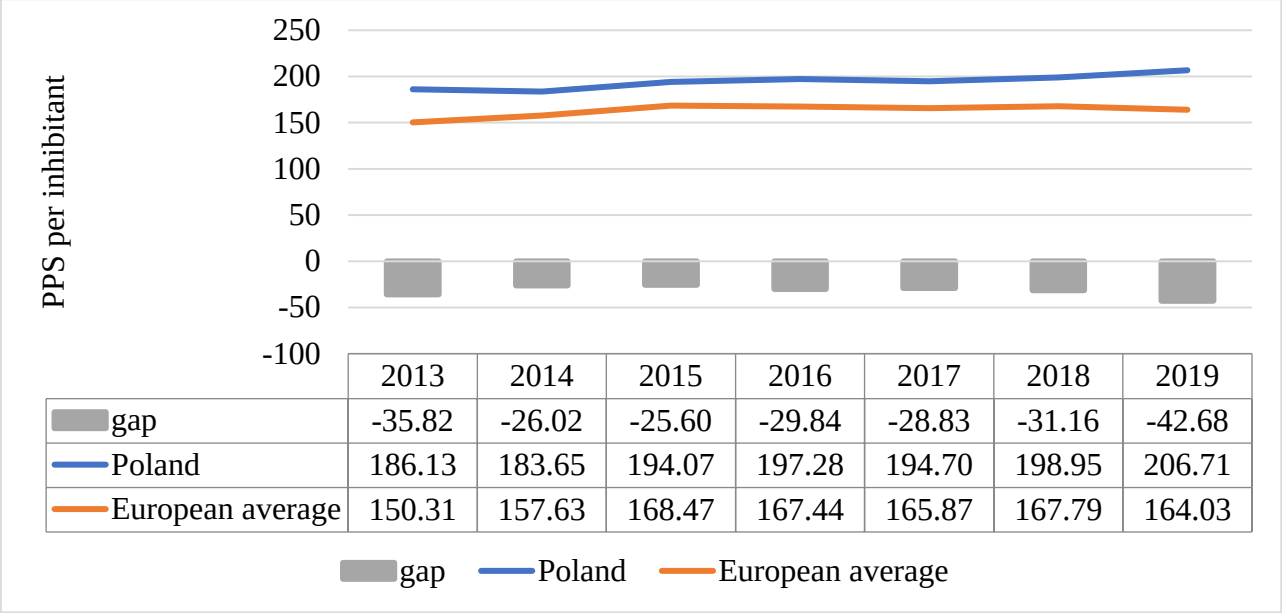
	2013	2014	2015	2016	2017	2018	2019
gap	122.99	116.45	118.83	121.34	111.93	110.28	123.05
Poland	87.77	92.50	100.37	100.27	109.88	116.34	115.62
EU-27	210.76	208.95	219.20	221.61	221.81	226.62	238.67

Source: Eurostat Health data file

Private Pharmaceutical Expenditure

What really distinguish Poland from the EU-27 average in terms of pharmaceutical expenditure is the high level of private spending on drugs (Figure 22). This imposes an extra burden on Polish patients. In 2013 the private expenditure on drugs in Poland was 186 Euros and in the EU average 150 Euros The gap was 36 Euros. In 2019 this gap increased further reaching the level of 43 Euros. Hence, we witness over time an increasing privatization of pharmaceutical expenditures in Poland (Figure 22). Examining the trend 2013-2019, private pharmaceutical expenditure increased in Poland from 186 Euros in 2013 to 207 Euros in 2019 (increase by 11%). The corresponding increase in the EU-27 average for the same period was 9%.

Figure 22. Private pharmaceutical expenditure the EU-27 average vs Poland* (Purchasing Power Standard, PPS per capita)



	2013	2014	2015	2016	2017	2018	2019
gap	-35.82	-26.02	-25.60	-29.84	-28.83	-31.16	-42.68
Poland	186.13	183.65	194.07	197.28	194.70	198.95	206.71
European average	150.31	157.63	168.47	167.44	165.87	167.79	164.03

Source: Eurostat Health data file

9.5. Relationship between pharmaceutical expenditure and GDP

Over the last three decades there has been a growing body of literature in health economics on the investigation of the relationship between health expenditure and GDP[43]. Several studies conducted by the OECD and the World Bank indicated that there is an enormous variation in the health expenditure per capita across countries and regions. A common finding among these studies, is the fact that there is a positive relation between health expenditure and GDP per capita. Economic growth contributes to the expansion of the health sector to satisfy increasing needs due to ageing of population, increase in chronic disease and new health technologies. In the early studies, during the 1970's, using cross section data the main attempt of several authors was to investigate the proportional change of pharmaceutical expenditure in relation to proportional change in GDP. They reached the conclusion that health is a "luxury good" implying that a one percentage increase in GDP would lead to a greater than one percentage increase in health expenditure. In the empirical literature, this result was initially

[43] Like Gerdtham U-G, Jönsson B. (2000). International comparisons of health expenditure: Theory, data an econometric analysis. In Culyer AJ, Newhouse JP (Eds.), Handbook of Health Economics. North-Holland: Elsevier.
OECD. Pharmaceutical expenditure. In Health at a Glance 2011: OECD Indicators, OECD Publishing. Retrieved from 10.1787/health_glance-2011-63-en
Carone G, Schwierz C, Xavier A. (2012). Cost-containment policies in public pharmaceutical spending in the EU. Economics Papers 461, European Commission
and many others

reached by Kleiman[44] in 1974 and was mostly promoted by Newhouse in 1975 and 1977[45]. It was a remarkable consistent among studies, that for every $1 increase in GDP, health spending would increase by $1.18 to $1.35. During the last decade there has been a great controversy among researchers on the value of income elasticity and the relevant connotation, whether health is a luxury (income elasticity greater than one e>1) or a necessity (income elasticity smaller than one e<1). Recent econometric studies in less developed countries, reached also inconclusive findings, some of them supporting the idea that health is a luxury good and some other that health is a necessity with an elasticity lower than unity.

We used in our study time series analysis covering the period 2002-2019 and we examined the relationship between pharmaceutical health expenditure per capita expressed in purchasing power parities PPS and GDP per capita expressed also in PPS (see Appendix 1. Econometric assessment of income elasticity). **The empirical findings of our work reached the conclusion that the pharma elasticity in Poland is lower than unity (e=0.63).** Hence a 100 euro increase in GDP would lead to a 63 euros increase in pharmaceutical expenditure. This finding generates further discussion at both academic and policy makers levels. Some policy makers at a National, European and International Organizations endorse the view that regulating pharmaceutical markets and adopting drastic cost containment policies, would achieve significant savings without affecting the quality of health care. This argument is further investigated in our analysis, with reference to access and the unmet needs in the Polish health care system.

9.6. Pharmaceutical Price Index in comparison to Consumer and Health Price Index

In an attempt to assess the evolution of pharmaceutical prices in Poland we will make use of three price indicators which have been used widely in the literature.

The first indicator is **the Consumer Price Index[46]** (CPI) which is a fully harmonized index used to establish valid comparisons in consumption trends across the European Member States. The base year for drawing time trends is 2015. For purpose of analysis this is equal to 100. The CPI index has been

[44] Kleiman E. The determinants of national outlay on health In Perlman M. (Ed.), The economics of health and medical care (pp. 66–81). London 1974: Macmillan
[45] Newhouse JP. Medical care expenditure: A cross-national survey. Journal of Human Resources 1977;12(1):115–125
[46] Eurostat data at FRED economic data. https://fred.stlouisfed.org/ (accessed 12.09.2022)

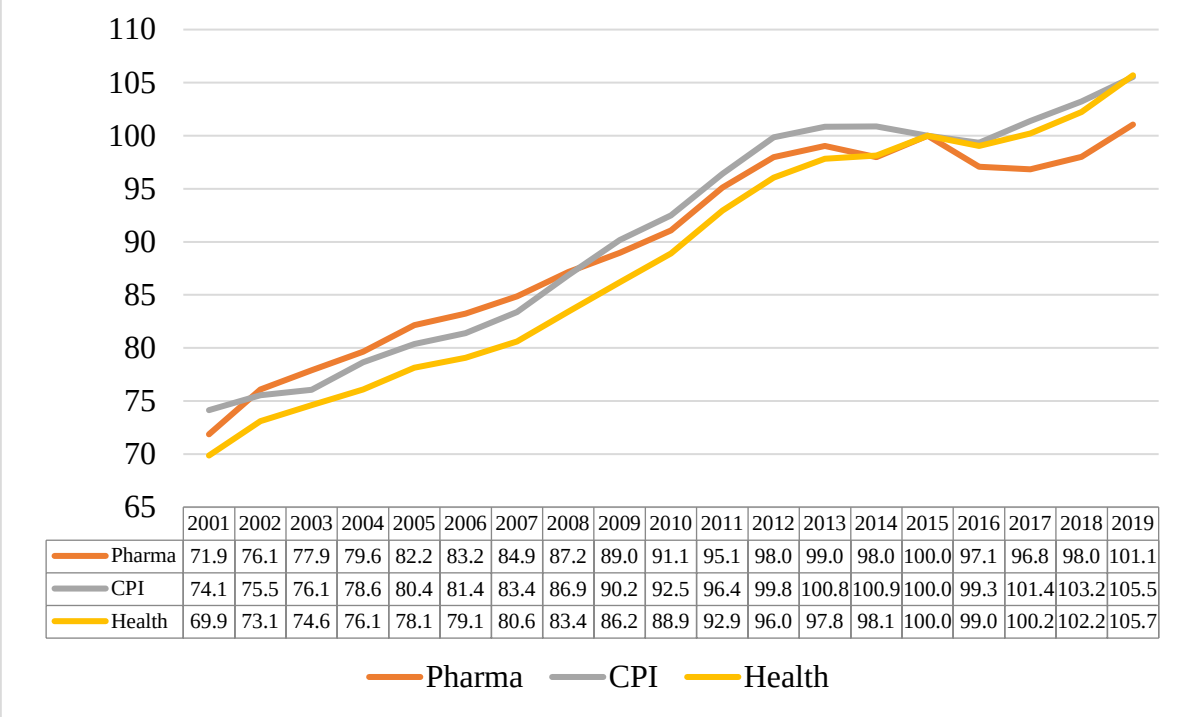
proposed by article 121 of the Treaty of Amsterdam and is used by the European Central Bank to assess inflation trends among the E.U. Member States.

The second indicator is the **Price Health Index** (PHI) which is based on the same methodology as the CPI. It includes a wide range of household purchases for health services, medical appliances, equipment, as well as purchases for outpatient and hospital services.

The third indicator is the **Price index for pharmaceutical** products. This indicator adopts the same methodology as CPI and PHI. This category includes all pharmaceutical products purchased by the "average household" such as medicinal drugs, inpatient and outpatient medicines, serums and vaccines, vitamins and minerals, and oral contraceptives. It excludes veterinary products, and articles for personal hygiene such as medicinal soaps.

In Figure 23 we present the evolution of the above three indicators for Poland over the period 2001 to 2019. The overall impression is that all three indicators evolved during this period with similar patterns. A step increase during 2001-2012, followed by a stabilization thereafter and a slight increase during 2017-2019.

Figure 23. Evolution of Harmonized Price Indexes for Consumer Prices (CPI), Price Health Index (Health) and Price index for pharmaceutical products (Pharma) for Poland

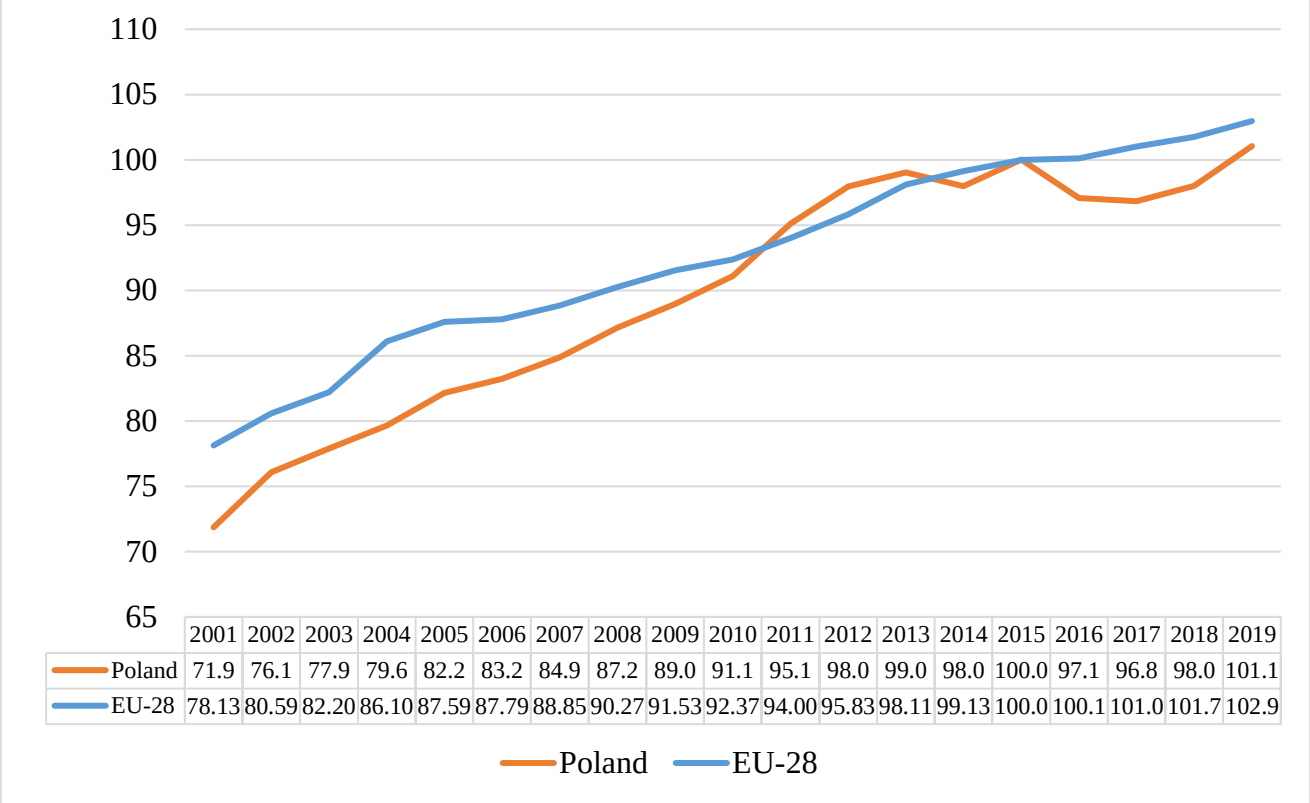


	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Pharma	71.9	76.1	77.9	79.6	82.2	83.2	84.9	87.2	89.0	91.1	95.1	98.0	99.0	98.0	100.0	97.1	96.8	98.0	101.1
CPI	74.1	75.5	76.1	78.6	80.4	81.4	83.4	86.9	90.2	92.5	96.4	99.8	100.8	100.9	100.0	99.3	101.4	103.2	105.5
Health	69.9	73.1	74.6	76.1	78.1	79.1	80.6	83.4	86.2	88.9	92.9	96.0	97.8	98.1	100.0	99.0	100.2	102.2	105.7

Source: Eurostat.

Figure 24 provides an overall assessment of the price pharma trends (as Price index for pharmaceutical products) in Poland in comparison to the EU average. The pharma index in Poland followed the same evolutionary process as the EU average. The rate of price increase in Poland during the period 2001-2012 was slightly higher than the EU average. The "plateau" in stabilization of the Polish prices during 2012-2018 is attributed to the implementation of 2012 Act on Reimbursement and new cost-containment methods (Pharma Law Act passed on January 1st, 2012; more details in the Chapter 10).

Figure 24. Price index for pharmaceutical products for Poland and EU-28 average



	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Poland	71.9	76.1	77.9	79.6	82.2	83.2	84.9	87.2	89.0	91.1	95.1	98.0	99.0	98.0	100.0	97.1	96.8	98.0	101.1
EU-28	78.13	80.59	82.20	86.10	87.59	87.79	88.85	90.27	91.53	92.37	94.00	95.83	98.11	99.13	100.0	100.1	101.0	101.7	102.9

Source: Eurostat (Consumer Price Indexes are provided for 28 countries of EU).

9.7. EU funding of Polish healthcare

Structural funds of European Union aim at reducing economic and social disparities between the member states. The general rule of the EU structural funds is the principle of co-financing. The share of the EU contribution in a total project's costs can vary significantly depending on the program, type of project and type of beneficiary. The health sector is only one of many benefiting from these funds. Under the recently completed financial perspective of 2014–2020, Poland was the biggest beneficiary

of EU structural funds in terms of both the total allocation, as well as its share devoted to health-related projects.[47]

Under the three financial perspectives of 2004–2006, 2007–2013, and 2014–2020 14,179 health related projects were implemented. Total value of health projects implemented in Poland was 7.01[48] billion EUR, including EU contributions of 4.8 billion EUR (68.7%).

The beneficiaries of health-related projects were health facilities (public and private); public administration (central and local; enterprises functioning in the health sector (SMEs), and non-government organizations (NGOs)). 47.2% of the projects were devoted to investments in infrastructure, while 52.8% – to education and public health. On infrastructural investment projects 88.9% of the funds were spent, with EU contribution of 86.4%. The projects were realized in all 16 voivodships separately and there were also projects whose implementation covered the total country, e. g. health data digitalization or educational projects.

The total capital expenditures on health financed from the EU structural funds and public budgets between 2004 and 2020 amounts to 12,2 billion EUR, 34.02% of which was the EU contribution to infrastructural projects, 30.2% constituted central budget expenditures and 35.8% – local governments expenditures. The amount of health expenditures within EU funds financed from both EU and national budgets changed from 460.53 million EUR in 2004 to 664,29 million EUR in 2020, being the highest in 2017. Their share in the total current health expenditures has decreased from 3,6% in 2010 to 1.9% in 2020, which shows how the total current expenditures have risen. The share of the expenditures from EU funds has also been decreased from 7.2% in 2004 to 3.1% in 2020, so more than two times. Share of GDP has not changed that much, being in 2004 the same as 2017, because of the biggest amount of health expenditures within EU funds in 2017. In 2020 this share has decreased to 0.19%.[49]

[47] Dubas-Jakóbczyk K, Kozieł A. European Union Structural Funds as the Source of Financing Health Care Infrastructure Investments in Poland—A Longitudinal Analysis. Front. Public Health 10:873433
[48] Converted by the authors from PLN at the rate: 1 euro = 4,74 PLN as for 27.08.2022, Central Polish Bank
[49] Dubas-Jakóbczyk K, Kozieł A. European Union Structural Funds as the Source of Financing Health Care Infrastructure Investments in Poland—A Longitudinal Analysis. Front. Public Health 10:873433

9.8. Health expenditure – main conclusions

- **The gap between EU-27 average and PL in the health care expenditure as a share (%) of GDP slowly grew in 2004-2019 from 3.1%-points to 3.5%-points. The gap between PL and EU-27 in health expenditure per capita waves, but in 2019 was almost the same as in 2008. The share of public funds in health expenditure in Poland in 2019 was lower than in EU-27 (71.8% vs 79.7% respectively).**
- **Comparing the proportion of public spending on individual health care services in PL vs EU-27 the main difference relates to pharmaceutical spending (shares of 36% and 57% respectively in 2019).**
- **While total pharmaceutical expenditure in Poland grows year by year decreasing slowly the gap between EU-27 average and Poland, the public share of pharmaceutical spending remains unchanged, while the private share grows. This suggests that high drug copayment may be an issue in Poland in comparison with EU-27.**
- **The share of out-of-pocket (OOP) spending is higher in PL than EU-27 average (PL 20.1% vs EU-27 15.3%); however, it should be noticed that OOP share in Polish health care budget is systematically decreasing while EU-27 share stay without change, so a convergence trend can be noticed. OOPs in PL are spent mostly on drugs (PL 12.6% of total spending vs EU-27 3.7% of total spending).**
- **In terms of the categories of services financed, in PL bigger portion of public funds is directed at inpatient care (PL 38% vs EU-27 30%; in terms of value per capita in 2019 PL spending counts for about 57% of EU-27 value) and more than twice less at long-term care (PL 7% vs EU-27 18%; in terms of value per capita in 2019: PL spending counts for about 17% of EU-27 value). Poland spent per capita 32% of EU-27 spending on the prevention, what may have significant impact on the health of Polish population.**

10. The Polish pharmaceutical polices

Polish accession to EU in 2004 forced Poland to implement of Council Directive 89/105/EEC of 1988 otherwise known as "Transparency Directive" into Polish healthcare system, thus the processes of making reimbursement decisions became more transparent and predictable in terms of timing.[50] However, soon – in 2011 – it became obvious that spending on the innovative drugs may be hard to mitigate (compare data for NHF drug reimbursement spending 2004-2011 on Figure. 1). The Act of 12 May 2011 on the Reimbursement of Pharmaceuticals, Foodstuffs for Special Nutritional Use and Medical Devices ("Act on Reimbursement", AoR) (Journal of Laws, 2011, No. 122, item 696[51]; the Act came into life on January 1st, 2012), regulates pricing and reimbursement system mainly for new drugs appearing at the European market (approved by EMA). It issued some new instruments to control the prices and spending – both of NHF and the patients:[52]

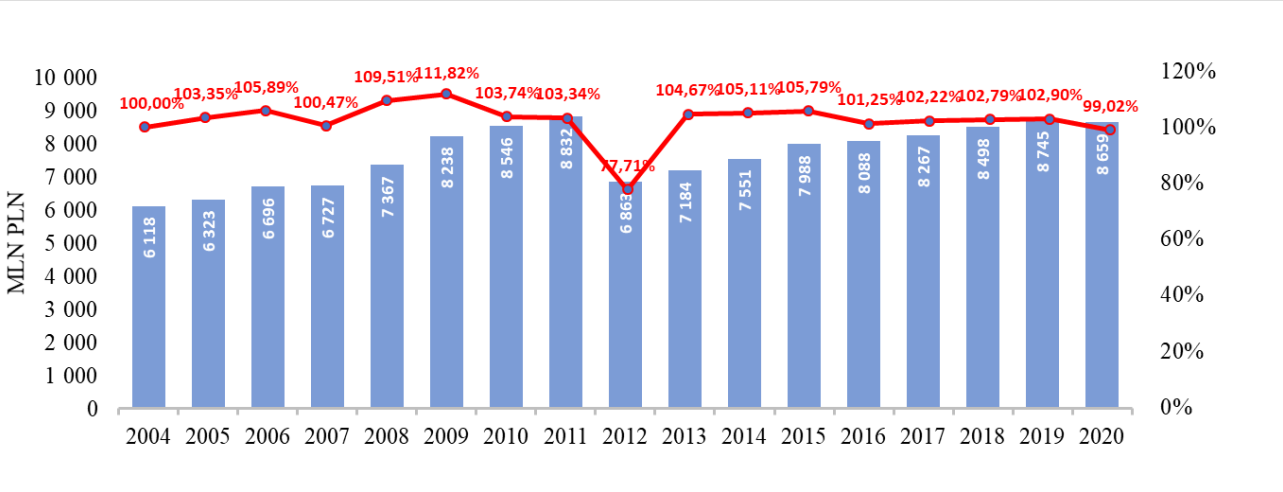
- It sets a ceiling at the annual expenditure on reimbursement of drugs, medical devices, and foods for special medical purposes (FSMPs) up to 17% of total National Health Found (NHF, the only payer in Polish health care system) budget[53] and if exceeded – enforces the claw back proportionate to Marketing Authorization Holder (MAH) income from reimbursement of its products
- Managed entry agreements (MEA) mechanism (in Poland called "risk sharing scheme") for risk of cost escalation containment
- A new body in the Ministry of Health – the Economic Commission to negotiate prices and specific reimbursement provisions with MAH
- Stiff reimbursed drug prices
- Lowering wholesales profit margin to 5%
- Patient copayment of 0%, lump sum, 30% of the price limit, 50% of the price limit.

[50] Lipska I, McAuslane N, Leufkens H, Anke Hövels A. A decade of Health Technology Assessment in Poland. IJTAHC, 2017;33(3):350–357
[51] Ustawa z dnia 12 maja 2011 r. o refundacji leków, środków spożywczych specjalnego przeznaczenia żywieniowego oraz wyrobów medycznych Dz. U. 2011, nr. 122, poz. 696 z pozn. zm. https://isap.sejm.gov.pl/
[52] Bochenek T et al. Zasady refundacji leków w polskim systemie ochrony zdrowia; Zdrowie Publiczne i Zarządzanie 2013;11(1):1–15
[53] See the Act of Reimbursement, article 3, item 1

- The level of reimbursement (0, lump sum, 30%, 50%) depends on the timing and total cost of the treatment (e. g. if total cost is high and the treatment is chronic the patient copayment is lower)

At the Figure 25 one may check the impact of these regulations on the spending on prescription reimbursement on drugs in the year 2012 and further.

Figure 25. National Health Fund spending on prescription reimbursement (blue bars; in million PLN) in consecutive years and its dynamics (red line)[54]

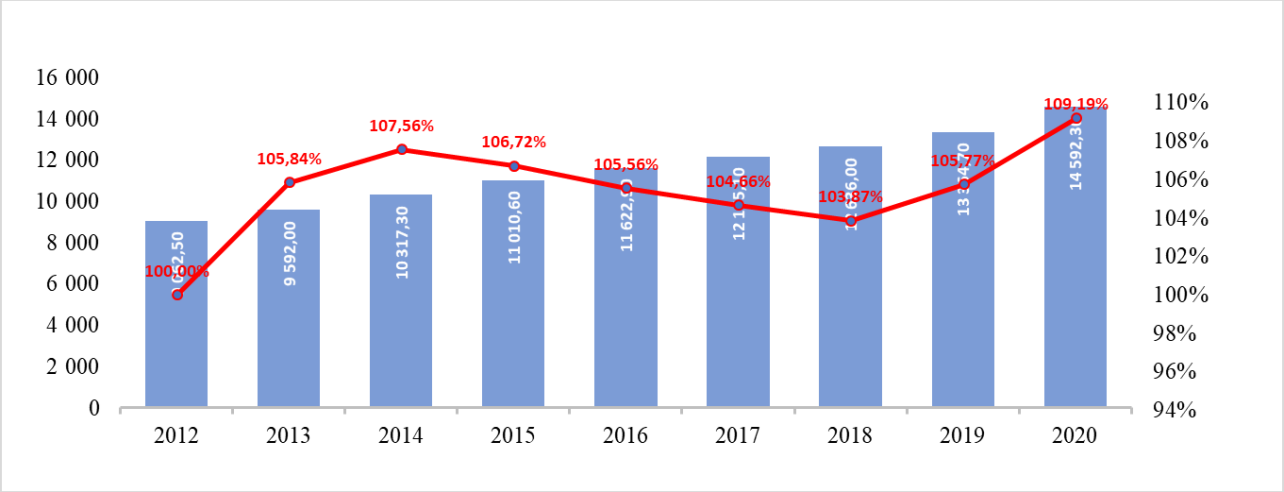


Source: NHF

Figure 26 presents the total NHF spending on the reimbursement for years 2012-2020 in Poland. It should be noted that under the Act of Reimbursement there was not a year that total reimbursement costs overcame 17% of NHF total budget, so no claw backs were issued. Specifically in 2020, with a total NHF budget of 88665.7 million PLN, (17% makes 16 516 million PLN) 14592.3 million PLN actually spent do not exceed the limit. Reimbursement total spending in 2021 was 16 558.6 million PLN.

Figure 26. National Health Fund total spending on reimbursement (prescription reimbursement + drug programs + chemotherapy + IIP; in million PLN) and its dynamics in the years 2012-2020[55]

[54] On the base of: NFZ Roczne sprawozdanie z wykonania planu finansowego NFZ na 2020 rok. Czerwiec 2021 https://www.nfz.gov.pl/zarzadzenia-prezesa/uchwaly-rady-nfz/uchwala-nr-102021iv,6560.html (access 2.08.2022)
[55] NFZ Roczne sprawozdanie z wykonania planu finansowego NFZ na 2020 rok. Czerwiec 2021 https://www.nfz.gov.pl/zarzadzenia-prezesa/uchwaly-rady-nfz/uchwala-nr-102021iv,6560.html (accessed 2.08.2022)



Source: NHF

10.1. Drug turnover and pricing

Drug turnover is regulated in Poland by the Pharmaceutical Law Act of 6 September 2001 (Journal of Laws, 2001, No. 126, item 1381).[56] Prior to the distribution of a drug, the MAH must apply for an authorization from the President of the Office for Registration of Medicinal Products, Medical Devices and Biocidal Products[57]. In the case of medicinal products registered under the centralized procedure, the European Medicines Agency issues a permit for parallel distribution from the member state where such a product was marketed.

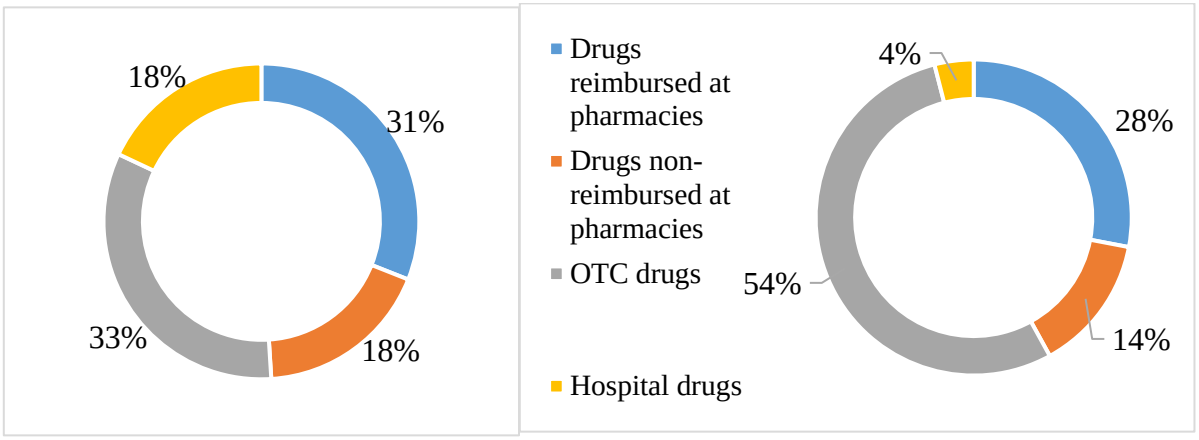
The categories of drugs for distribution are differentiated based on their legal status. Pharmaceutical law establishes the following categories of medicinal products:

- Available without prescription (over the counter, OTC)
- Available on prescription only (Rp)
- Available on prescription only, for restricted use (Rpz)
- Available on prescription only, containing narcotic drugs or psychotropic substances specified in separate regulations (Rpw)
- For hospital use only (Lz)

[56] Ustawa z dnia 6 września 2001 r. Prawo farmaceutyczne Dz. U. 2001, nr. 126, poz. 1381 z pozn. zm. https://isap.sejm.gov.pl/
[57] Urząd Rejestracji Produktów Leczniczych, Wyrobów Medycznych i Produktów Biobójczych https://www.urpl.gov.pl/en/office

OTC drugs forms a significant share of Polish drug market, accounting for 31% of total drug expenses in 2017 (28% of total drug volume),[58] what put Poland at the first place among EU countries (Figure 27).

Figure 27. The structure of Polish pharmaceutical market in 2017 (left – by expenses, right – by number of packages)



Source: OECD

Drug prices are regulated only in case of the reimbursed drugs. The prices of OTC drugs and not reimbursed drugs available on prescription only are not regulated.[59]

In January 2019 the e-prescriptions system was launched in Poland and from January 2020 e-prescriptions are compulsory,[60] what helps in monitoring drug turnover and prices.

10.2. Drug reimbursement

Drug reimbursement in Poland is regulated by the Act of Reimbursement (the Act comprises some medical devices as well, available for the prescription for individual patients, and foods for special medical purposes (FSMPs)). Drug may be reimbursed in one of four categories[61]:

1. Drugs, medical devices, and FSMPs available in the pharmacy on the prescription:
    a. In all registered indications, as in the EPAR[62]

[58] Polityka lekowa państwa 2018–2022, Ministerstwo Zdrowia, 2018 https://www.gov.pl/web/zdrowie/rada-ministrow-przyjela-dokument-polityka-lekowa-panstwa-20182022 (access 12.08.2022)
[59] Zawada A, Korecka-Polak A, Kobuszewski B. Ceny leków – teoria i praktyka. Zdrowie Publiczne i Zarządzanie 2019;17 (4):194–202
[60] National Health Fund information at https://www.nfz.gov.pl/aktualnosci/aktualnosci-centrali/od-8-stycznia-czas-e-recepty,7549.html (access 13.08.2022)
[61] See the Act of Reimbursement, article 6
[62] European public assessment report (EPAR) https://www.ema.europa.eu/en/medicines/what-we-publish-when/european-public-assessment-reports-background-context (access 12.08.2022)

b. In the specific clinical status only (directly indicated at the reimbursement list)

2. Drugs and FSMPs delivered (mainly in hospitals) in the "drug program"
3. Drugs used for chemotherapy (delivered in hospitals):
    a. In all registered indications, as in the EPAR[63]
    b. In the specific clinical status only (directly indicated at the reimbursement list)
4. Other than above drugs and FSMPs used for medical services delivery.

It should be noted that drugs may be reimbursed in Poland in both registered and specific non-registered indications[64] (off-label), if directly indicated on the reimbursement list. The off-label reimbursement covers e. g. administration of the drugs registered for adults to the children (in the adjusted doses) or some widely accepted clinical practices.

Coming to the levels of reimbursement, the drug, medical device, and FSMP may be available to the patient[65]:

1. For free
2. For the lump sum
3. For the 30% or 50% of the reimbursement limit (explanation of "limit groups" see below)

Patient basic co-payment in the case of reimbursed drugs (FSMPs and prescribed medical devices) depends on the treatment costs[66]: the drugs in drug programs are delivered free for patients; for the drugs delivered at the prescription, if the drug should be administered longer than for 30 days and 30% of the cost of therapy exceeds 5% of minimal remuneration the lump sum (of 3.20 PLN; in Aug 2022 about 0.70 euro) it is paid; 50% copayment is set in case of therapies not longer than 30 days and 30% in other cases. It should be noted that the drug is reimbursed only for the indication and population listed, it may happen that for some patients or indications (not specified at the reimbursement lists) it will be available only with a full price.

The real cost of the drug for the patient is calculated in a bit sophisticated way. Drugs are grouped in the so called "limit groups"[67] according to similar way of acting or similar indication. There are rules of setting an upper limit of price for the whole group; the reimbursement fee is counted for this limit

[63] European public assessment report (EPAR) https://www.ema.europa.eu/en/medicines/what-we-publish-when/european-public-assessment-reports-background-context (access 12.08.2022)
[64] See the Act of Reimbursement, article 6
[65] See the Act of Reimbursement, article 6 item 2
[66] See the Act of Reimbursement, article 14
[67] See the Act of Reimbursement, chapter 3

and for any drug more expensive than the limit and the difference is to be additionally paid by the patient.

As described above, the level of reimbursement depends on the time length and cost of the therapy with a specific drug, what protects patients in case of chronic, costly treatment with specific drug but does not protect them from high costs of multidrug treatment. This issue was noted in 2015 when a special list of drugs delivered for free to the patients older than 75 y. o(the population mostly affected by multidrug treatments) was introduced.[68]. Currently (July 1st, 2022) there are 2052 products (178 active substances in 83 limit groups) at this list.[69] The rules of payment for these "free" drugs are as described above (the difference between the drug price and the limit is paid by patient).

The lists of reimbursed products are updated every second month, and they may introduce changes not only in terms of adding/removing a medical product, but also in setting new limits in some limit groups. When a drug is added/removed to/from a specific limit group a new one may set the new limit for copayment – what may change both the payer's and the patient's expenses. Although drugs are grouped in the limit groups according to their similar indication or similar way of acting, for the most expensive treatments the group consists of a single drug due to ethical reasons (not to force patients to pay high difference between the drug price and price limit for the group).

For the innovative drugs, the "drug programs" are designed, which on the one hand facilitates patient access to very expensive drugs and concomitantly is a kind of cost containment tool. They provide a treatment in the controlled manner, described in detail in qualification criteria for patients. Currently (July-August 2022) there are 111 active drug programs[70]). The inclusion/exclusion criteria in drug programs are regularly updated to eliminate their mostly criticized limitations, but some of them are perceived by patients as a kind of partial reimbursement (e. g. see Oncoindex[71]. Drug programs are delivered by hospitals. Drugs reimbursed in drug programs, as well as all drugs and services delivered in hospitals having a contract with NHF signed, are totally free for patients.

[68] The Act of 27 August 2004 on Health Care Services Financed from Public Sources, article 43a
[69] https://75plus.mz.gov.pl/ (access 12.08.2022)
[70] Obwieszczenie Ministra Zdrowia z dnia 21 czerwca 2022 r. w sprawie wykazu refundowanych leków, środków spożywczych specjalnego przeznaczenia żywieniowego oraz wyrobów medycznych na 1 lipca 2022 r. https://www.gov.pl/web/zdrowie/obwieszczenia-ministra-zdrowia-w-sprawie-wykazu-refundowanych-lekow-srodkow-spozywczych-specjalnego-przeznaczenia-zywieniowego-oraz-wyrobow-medycznych-ktory-wejdzie-w-zycie-1-lipca-2022-r (access 14.08.2022)
[71] https://oncoindex.org/en/poland (access 3.08.2022)

10.3. The role of Health Technology Assessment

10.3.1. Legal settings

Introduction of Health Technology Assessment (HTA) into Polish health care system, took place after Poland accession to EU in 2004 due to obligatory implementation of Council Directive 89/105/EEC of 1988 otherwise known as "Transparency Directive".[72] EU co-funded project Transition Facility Project (Oct 06–Apr 08) helped in this undertaking. Polish Agency for HTA and Tariff System (AOTMiT; former AOTM) has been established in 2005 by an Ordinance of the Minister of Health; later in 2009 the AOTMiT position was reinforced with the amendment of Act of 27 August 2004 on Health Care Services Financed from Public Sources ("Act on HC Services") (Journal of Laws, 2004, No. 201, item 2 135[73]) setting AOTMiT formal tasks. Thus, AOTMiT became the formal entity of Polish Administration.

The role of HTA in Poland has been considerably amended in 2011 with the Act on Reimbursement[74] (AoR). It regulates the duties of pharma companies that want their products to be placed on the reimbursement list according to AOTMiT (and other bodies like Economic Commission in the Ministry of Health) proceedings. For every product, which active substance has not been at the reimbursement lists before, the MAH is obliged to provide to AOTMiT the full HTA report for critical assessment.

Currently all HTA activities in Polish health care system are set and systematically improved by ongoing amendments of these two Acts. Specifically, starting January 1st 2015, on the base of the amendment of the "Act on HC Services" of 22 July 2014, AOTM (Agency for HTA) started a tariffication of health care services and its name has been changed to AOTMiT (Agency for HTA and Tariff System).[75] Consecutive transformations of Polish health care system are described in the

[72] Lipska I, McAuslane N, Leufkens H, Anke Hövels A. A decade of Health Technology Assessment in Poland. IJTAHC, 2017;33(3):350–357
[73] Ustawa z dnia 27 sierpnia 2004 r. o świadczeniach opieki zdrowotnej finansowanych ze środków publicznych Dz. U. 2004, nr. 201, poz. 2135 z pozn. zm. https://isap.sejm.gov.pl/
[74] Ustawa z dnia 12 maja 2011 r. o refundacji leków, środków spożywczych specjalnego przeznaczenia żywieniowego oraz wyrobów medycznych Dz. U. 2011, nr. 122, poz. 696 z pozn. zm. https://isap.sejm.gov.pl/
[75] https://www.aotm.gov.pl/en/tariff-system/

publications edited by European Observatory of Health Systems and Polices WHO[76], specifically of the series "Health System Review"[77].

Additionally, methodological guidance for performing HTA assessments for Polish health care system are described in the Health Technology Assessment Guidelines[78] by AOTMiT and – for the applications according to the Act of Reimbursement – strengthened by the regulation[79] of the Minister of Health (in 2012; current version of 2021).

10.3.2. The reimbursement application and decision-making process

Due to the strong formal placement of HTA in Polish health care system, many system actors have their HTA-related obligations dependent to the specific reimbursement-related pathways; however, some of these regulations goes into opposite directions (in terms of benefits for patients). As said, the Act on Reimbursement enforces MAH to apply for the reimbursement of its health care product (drug, medical device or FSMP) what gives a good position to the MoH to negotiate the product price but on the other hand, it limits the active role of MoH in shaping the reimbursement lists. In such circumstances MAHs are carefully designing their marketing strategies making Poland a late adopter of potentially valuable therapies[80,81]. Thus, MAH has to start the process and if the active substance of the drug has not been at the list earlier – have to provide full health technology assessment (HTA) report for critical assessment and appraisal of Polish HTA Agency (AOTMiT)[82]. If the active substance of the drug is already at the list (another product with the same active substance is currently reimbursed), the applicant provides only Budget Impact Analysis for the MoH information (AOTMiT is not involved in the process in such a case).

[76] https://eurohealthobservatory.who.int/publications/all-publications?regionscountries=0ffbab44-418b-470b-a7ab-63176f54daa8https://eurohealthobservatory.who.int/publications/all-publications?regionscountries=0ffbab44-418b-470b-a7ab-63176f54daa8

[77] As for August 1st, 2022, the most actual publication is for 2019 year (the cut-off date for the data – August 2018): Sowada C, Sagan A, Kowalska-Bobko I, Badora-Musiał K, Bochenek T, Domagała A, Dubas-Jakóbczyk K, Kocot E, Mrożek-Gąsiorowska M, Sitko S, Szetela A, Szetela P, Tambor M, Więckowska B, Zabdyr-Jamróz M, van Ginneken E. Poland: Health system review. Health Systems in Transition, 2019; 21(1): 1–235

[78] Health Technology Assessment Guidelines, v. 3.0, AOTMiT, Warsaw, August 2016 https://www.aotm.gov.pl/en/guidelines/medicinal-products-assessment-guidelines/ (accessed 3.08.2022)

[79] Regulation of The Minister of Health of 8 January 2021 on the minimum requirements to be satisfied by the analyses accounted for in the applications for reimbursement and setting the official sales price and increasing the official sales price of a drug, a special purpose dietary supplement, a medical device, which do not have a reimbursed counterpart in a given indication. Journal of Laws, 2021, item 74

[80] Lipska et al. 2017

[81] Oncology patients' access to drug therapies in Poland in view of current medical knowledge. Report March 2017. Alivia, PEX PfarmaSequence https://alivia.org.pl/wp-content/uploads/sites/10/raport2017/ (access 3.08.2022)

[82] The Agency of HTA and Tariff System, AOTMiT www.aotm.gov.pl/en

The reimbursement decision making process should be transparent, what means that the AOTMiT President is obliged to publish[83] all MoH orders, the schedules of Transparency Council and Council for Tariff System activities, the Councils statements, and opinions, its own recommendations, and opinions and at least, some of the assessments and reports supplied by the applicants and performed in the AOTMiT. On the other hand, MoH in general is not obliged to publish the substantiation of its decision – thus all transparency seems to lay at the AOTMiT side[84]. The transparency of the proceeding is limited by the Act of 16 April 1993 on combating unfair competition[85] (Journal of Laws, 1993, No. 47, item 211) that enables the MAH to conceal some data in the HTA report. In the course of transparency procedure, the Agency Agency's verification analysis for the reimbursement application on the base of AoR is presented[86] together with applicant HTA report for seven days for public comments (everyone may supply a comment providing the filled conflict of interest (CoI) form is attached). The number of people active in this process systematically grows.

The potential conflict of interest (CoI) issues is regulated by the law. AOTMiT President, the members of Transparency Council (TC) and Council for Tariff System (CTS), AOTMiT analysts should not have the well-defined conflict (members of TC and CTS must report it for themselves as well as for family members). Experts providing their opinion for the assessment process or for the Transparency/Tariff System Councils should report potential CoI and the AOTMiT President decides on the usage of their opinions.

10.3.3. Cost containment mechanisms

The AoR defines the criteria[87] to be considered by the MoH when deciding on the reimbursement of the applied product. These are: the statement (on the reimbursement and the suggested price) of the Economic Commission, the recommendation of the President of AOTMiT, the societal impact of the health status of the patient, clinical and practical effectiveness, safety, benefit/risk ratio, cost/effectiveness ratio of current clinical practice (comparator), cost-competitiveness, impact of the reimbursement on the payer budget, clinical alternative options, credibility and precision of the assessments, country health priorities, and the cost-effectiveness threshold. The latter is set at the three

[83] See the Act of HC Services, article 31o, item 2.5
[84] An important change can be observed in October 2021: Ministry of Health placed at its website list of the therapies of high innovative level and the protocols of the negotiations with the MAHs on their reimbursement https://www.gov.pl/web/zdrowie/fmltowpi (access 3.08.2022)
[85] Ustawa z dnia 16 kwietnia 1993 r. o zwalczaniu nieuczciwej konkurencji https://isap.sejm.gov.pl/
[86] See https://bipold.aotm.gov.pl/index.php/zlecenia-mz-2022 (access 3.08.2022)
[87] See the Act of Reimbursement, article 12

times Gross Domestic Product (GDP) per capita (the mean value of three years preceding the current year by 5-2 years, e.g., the threshold for 2022[88] has been set in October 2021 on the base of the mean GDP per capita for years 2017-2019 at 3 x 55 586 PLN = 166 758 PLN. From 2012 this threshold has been growing year by year and never decreased. The AOTMiT analysts' task is to check if the drug is cost-effective and if not – to count the threshold price (at which the cost-effectiveness ratio equals the threshold).

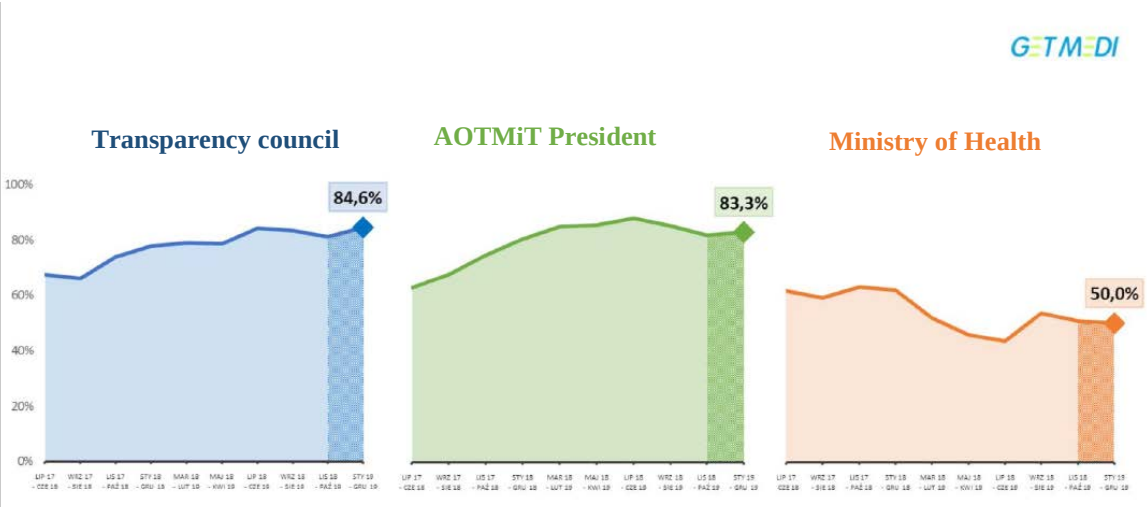
Another cost-containment instrument implemented by the AoR is managed entry agreements (MEA)[89]. Theoretically, Act of Reimbursement enumerates different possible types of MEAs[90]: financial: discounts or price-volume agreements, pay-backs (clawbacks), payment by result,[91] and other proposed by the MAH; however, in 2013[92] clawbacks are the most popular kind of MEA (48% of 52 MEAs) followed by reduced prices (15.4% of 52 MEAs).

The cost-effectiveness threshold and MEAs are meaningful tools for keeping the prices under control. It is Economic Commission (EconC) in the Ministry of Health which, keeping in mind the AOTMiT assessment and its President recommendation, negotiates with MAH the final price and MEAs. It should however be understood, that the AOTMiT President recommendation is a kind of advice to the MoH, saying e.g., that the reimbursement might be accepted if the proper RSS will be proposed. Thus, the final MoH decision may not be in line with the recommendation. Commercial portal GETMEDI[93] provides ongoing statistics of the timing and results of the reimbursement processes; its last open data[94] for the reimbursement processes according to AoR are for the period July 2017-December 2019. Figure 28 presents GETMEDI statistics of the positive statements of Transparency Council (the Body advising the AOTMiT President) – blue, the AOTMiT President (green), and final MoH

[88] See AOTMiT website in Polish https://www.aotm.gov.pl/aktualnosci/najnowsze/komunikat-prezesa-agencji-oceny-technologii-medycznych-i-taryfikacji-w-sprawie-obowiazujacej-od-dnia-29-pazdziernika-2021r-wysokosci-progu-kosztu-uzyskania-dodatkowego-roku-zycia-skorygowanego-o-jak/ (accessed 03.08.2022)
[89] See the Act of Reimbursement, article 11, item 5 – MEAs are called in Poland "Risk Sharing Schemes"
[90] The exact wording of the AoR: making the level of the applicant's revenues dependent on the health effects achieved; making the official sales price dependent on the applicant providing supplies at a reduced price as specified in the negotiations on the price of the medicine; making the official sales price dependent on the level of turnover of the medicine; making the official sales price dependent on a pay-back of a part of the reimbursement obtained to the entity which is obliged to finance benefits with public funds; other, no classified RSSs.
[91] The categories mentioned here are as defined by Dabbous M, Chachoua L Caban A, Toumi M. Managed Entry Agreements: Policy Analysis from the European Perspective. Value in Health 2020;23(4):425–433
[92] Iwanczuk T, Zawodnik S, Hermanowski TR, Matusewicz W. Risk-Sharing Schemes in Poland – Analysis and Classification of RSS Proposed in Reimbursement Applications Received by AHTAPOL in 2013. Value in Health 2014;17:A323-A686
[93] https://getmedi.pl/leki-refundowane-w-polsce/ (in Polish only)
[94] https://getmedi.pl/news/65/praktyka-refundacyjna-w-ostatnich-12-miesiacach-aktualizacja-styczen-2020 (access 2.08.2022)

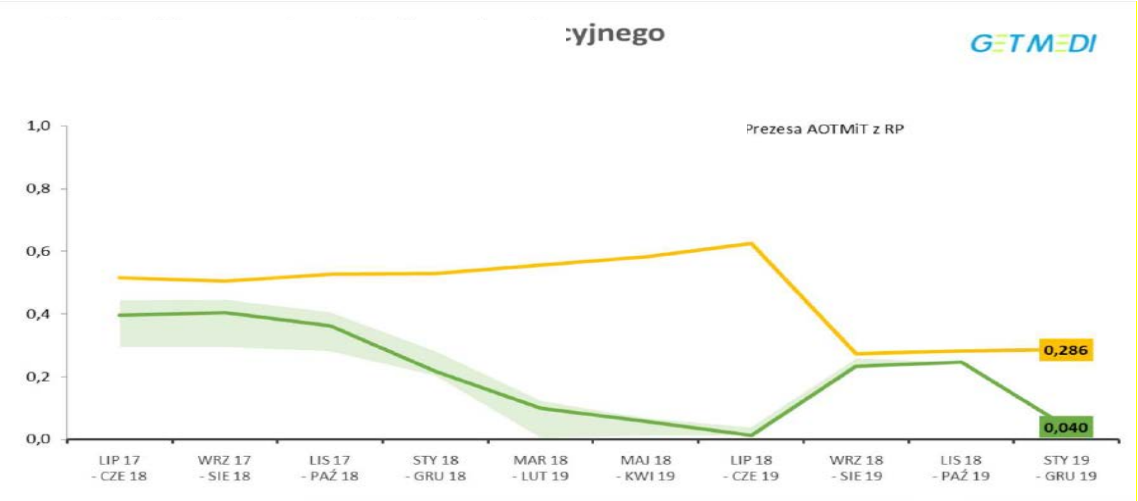
reimbursement decisions (orange). While the decisions of AOTMiT bodies seems rather similar, the ones of MoH are much stricter. Figure 29 presents the accordance (measured as Cramér's V) of the decisions which in the case of Transparency Council and AOTMiT President is much higher than in the case of AOTMiT President and Minister of Health.

Figure 28. The percentage of positive statements of Transparency Council (blue), the AOTMiT President (green), and final MoH positive reimbursement decisions (orange). July 2017-December 2019 GETMEDI.PL



Source: GETMEDI

Figure 29. Accordance (Cramér's V) of the decisions of Transparency Council vs. AOTMiT President (yellow line) and AOTMiT President vs. Minister of Health (green line). July 2017-December 2019 GETMEDI.PL



Source: GETMEDI

Every reimbursement decision is applied for 2-3 years and after this period, reapplication is necessary. The product price proposed in the reapplication should not be higher than 75%[95] of the price proposed in the previous application. As well for the product whose active substance is already reimbursed (another product with the same active substance is present on the list) MAH should not claim for price higher than 75% of the drug on the list. This mechanism promotes quick erosion of the prices, specifically when the patent protection period is over

[95] See Act on Reimbursement, article 13

11. Health unmet needs in Poland

In the Eurostat data[96] one can see the decreasing gap between self-reported unmet needs for EU-27 average and in Poland for medical care in general, and for medical examination. However, these data should be assessed in more details.

11.1. Self-reported unmet needs for medical care[97]

Self-reported unmet needs for medical care, concern a person's own assessment of whether he or she needed examination or treatment for a specific type of health care, but did not have it or did not seek it because of the following three reasons:

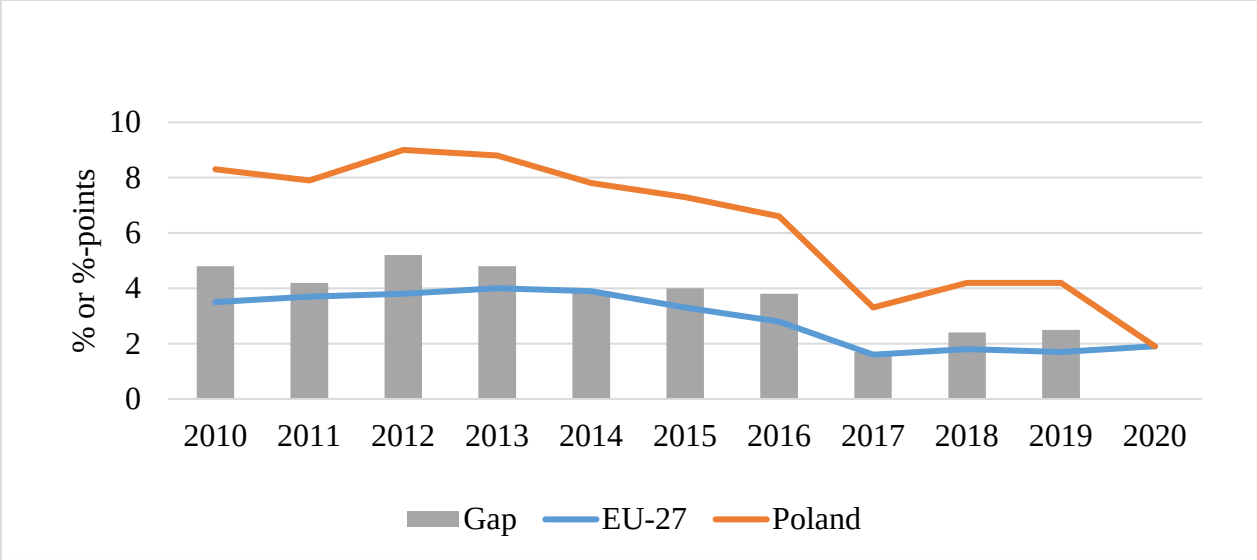
- Financial reasons,
- Waiting list,
- Too far to travel.

Medical care refers to individual healthcare services (medical examination or treatment excluding dental care) provided by or under direct supervision of medical doctors or equivalent professions according to national healthcare systems. Data are collected from the European Statistics of Income and Living Condition survey and refer to such needs during the previous 12 months. Data are expressed as percentages within the population aged 16 years old and over, living in private households.

The gap between EU-27 average and Poland in terms of self-reported unmet needs for medical care (grey bars at Figure 30), has decreased from 4.8% in 2010 to 0.0% in 2020 – last available data does not reveal any gap between EU-27 average and Poland (Figure 30). Share of people with self-reported unmet needs for medical care has also decreased in Poland (from 8.3% to 1.9%). The declines between 2016 to 2017 and 2019 to 2020 were the highest: 3.3 percentage points and 2.3 percentage points respectively.

[96] Self-reported data are collected from the European Statistics of Income and Living Condition (EU-SILC) survey and refer to such needs during the previous 12 months. Data are expressed as percentages within the population aged 16 years old and over living in private households.
[97] Eurostat data https://ec.europa.eu/eurostat/databrowser/view/tespm110/default/table?lang=en (accessed 17.08.2022)

Figure 30. Shares of people with self-reported unmet need for medical care, EU-27 average and Poland (2010-2020)

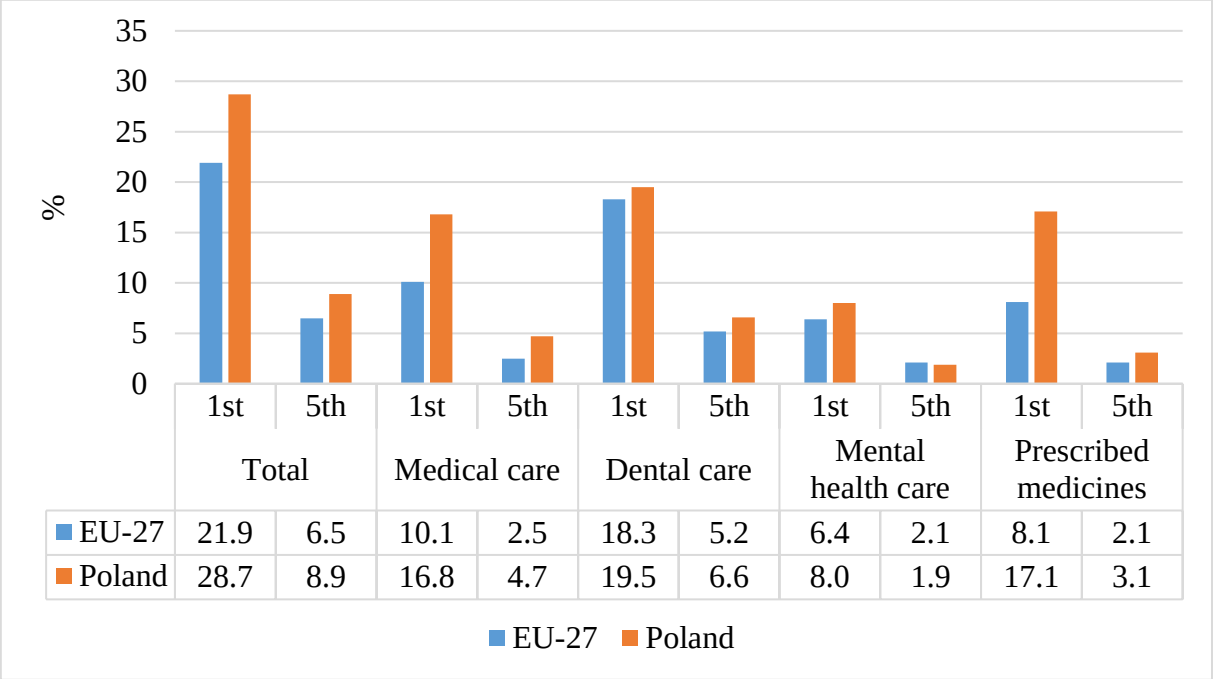


Source: Eurostat

However, it would be of value to compare the gaps between EU-27 average and Poland in unmet medical needs for specific health care-related services and due to specific reasons in vulnerable population groups.

Let's see how unmet medical needs for specific health care services impacted the vulnerable Polish population groups: the lower-income groups (1st quintile) as compared to the highest-income group (5th quintile). As can be seen at the Figure 31 the difference between EU-27 and Poland of 6.8 percentage points in total needs are induced mainly by unmet needs for prescribed medicines (9.0 percentage points) and medical care (6.7 percentage points) in the lowest-income group thus pointing at inequities in the access to health care.

Figure 31. Shares of people self-reporting unmet needs for specific health care-related services due to financial reasons by income quintile in Poland and EU-27 (2019)[98]

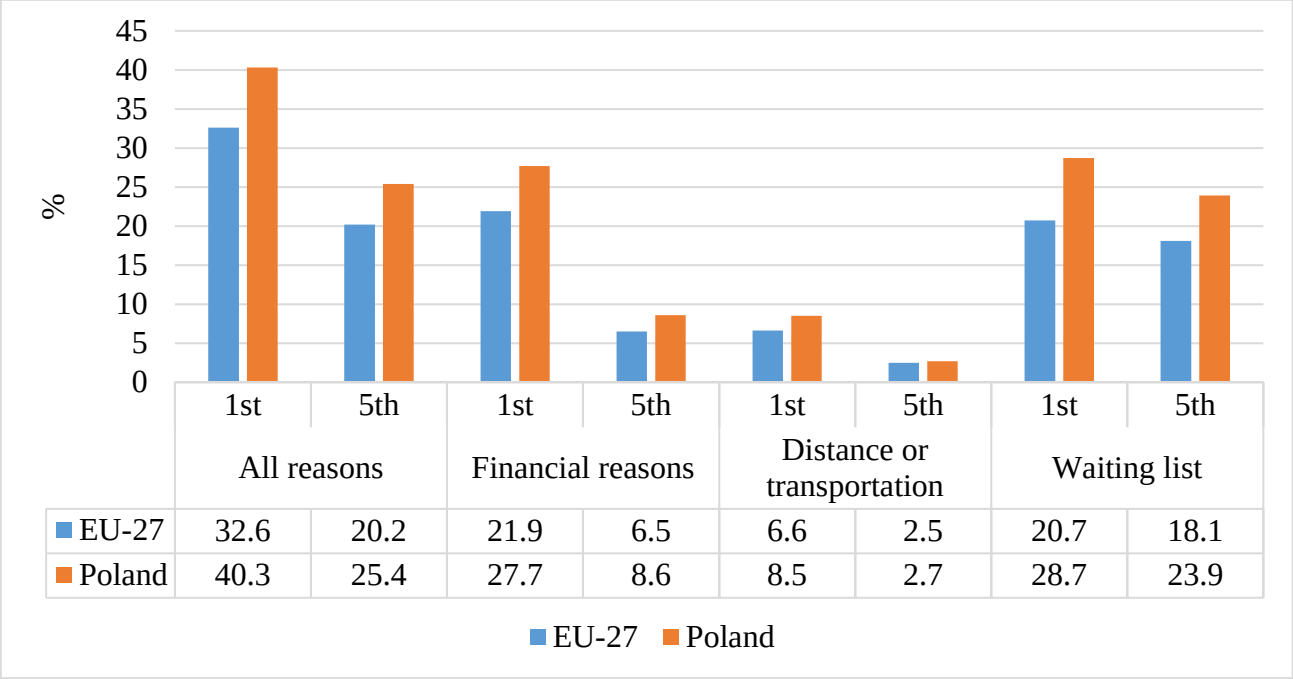


Source: Eurostat

When analyzing the self-reported unmet needs for health care in the poorer as compared to the richest by reasons (Figure 32), data confirms that the waiting lists are the biggest issue for the poorest people in Poland, the financial reasons being the next, but the difference in shares of people reporting them are only one percentage point (so the impact is similar). This relation (the impact of waiting lists vs financial issues) is reverse in EU-27. However, the difference between Poland and EU-27 for the poorest people is of 8.0 percentage points for waiting lists and of 5.8 percentage points for financial reasons. For the highest income quintile, the waiting lists are the greatest contributor to the unmet needs in Poland.

[98] Eurostat data https://ec.europa.eu/eurostat/web/products-datasets/-/tespm110. (accessed 15.08.2022)

Figure 32. Shares of people self-reporting unmet needs for health care by specific reasons and income quintile in Poland and EU-27 average (2019)[99]

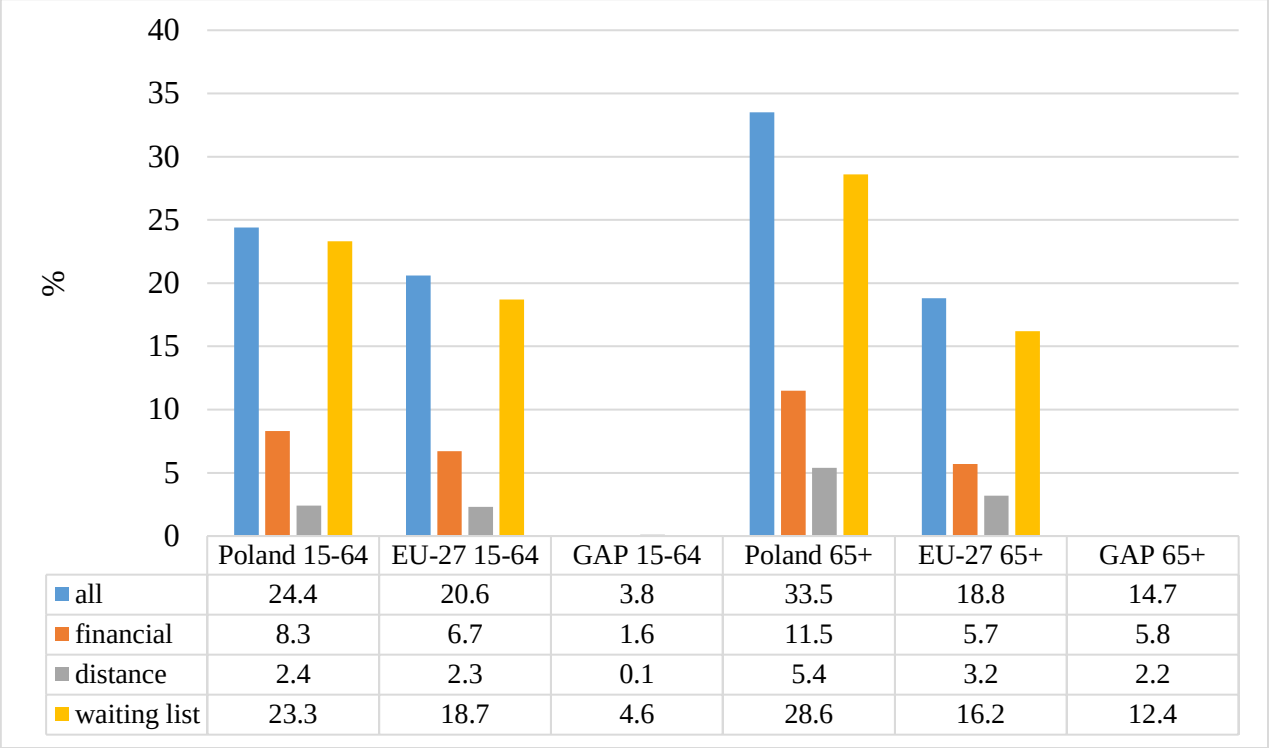


Source: Eurostat

Additionally, as can be seen at Figure 33, the unmet needs impacted the population over 65 years of age and the main reason of this are long waiting lists, financial reasons being the next. Thus, the long waiting lists for medical care services are the main issue for all Polish population in terms of unmet medical needs. Inversely, the distance to the medical services provider is an issue of relative low importance.

Figure 33. Shares of people in Poland and EU-27 self-reporting unmet medical needs in age groups 15-64 y. o. and 65+ y. o. due to different reasons (2019)[100]

[99] Eurostat (https://ec.europa.eu/eurostat/web/products-datasets/-/hlth_ehis_un2d) (access 15.08.2022)
[100] Eurostat https://ec.europa.eu/eurostat/databrowser/view/tespm110/default/table?lang=en (accessed 17.08.2022)



	Poland 15-64	EU-27 15-64	GAP 15-64	Poland 65+	EU-27 65+	GAP 65+
all	24.4	20.6	3.8	33.5	18.8	14.7
financial	8.3	6.7	1.6	11.5	5.7	5.8
distance	2.4	2.3	0.1	5.4	3.2	2.2
waiting list	23.3	18.7	4.6	28.6	16.2	12.4

Source: Eurostat

We focus here on the people of the lower-income groups, as they are the most susceptible to the impact of high unmet health needs due to financial issues and long waiting lists (which may themselves generate financial issues as people waiting too long may seek out-of-pocket payable care) on the economic condition of their households. They may experience catastrophic spending, impoverishing their household budgets. The analysis of 2010[101] revealed much higher levels of catastrophic health spending in Poland than in Denmark and Germany (Figure 34). The newer analysis of Polish data by WHO[102] found that in 2014 the share of households with catastrophic health spending in Poland was a bit lower but still high (in terms of OOP/CTP>40% from 9.4% in 2010 to 8.6% in 2014 – around 3.7 million people; authors' analysis based on household budget survey data).

Figure 34. The percentages of households experiencing catastrophic* out-of-pocket (OOP) total health care spending: comparison of Poland (2010), Germany (2009) and Denmark (2010)[103]

[101] Zawada A, Kolasa K, Kronborg C et al. Comparison of the Burden of Out-of-Pocket Health Payments in Denmark, Germany and Poland. Global Policy (2016) doi: 10.1111/1758-5899.12331
[102] Tambor M, Pavlova M. Can people afford to pay for health care? New evidence on financial protection in Poland. Copenhagen: WHO Regional Office for Europe; 2020. Licence: CC BY-NC-SA 3.0 IGO
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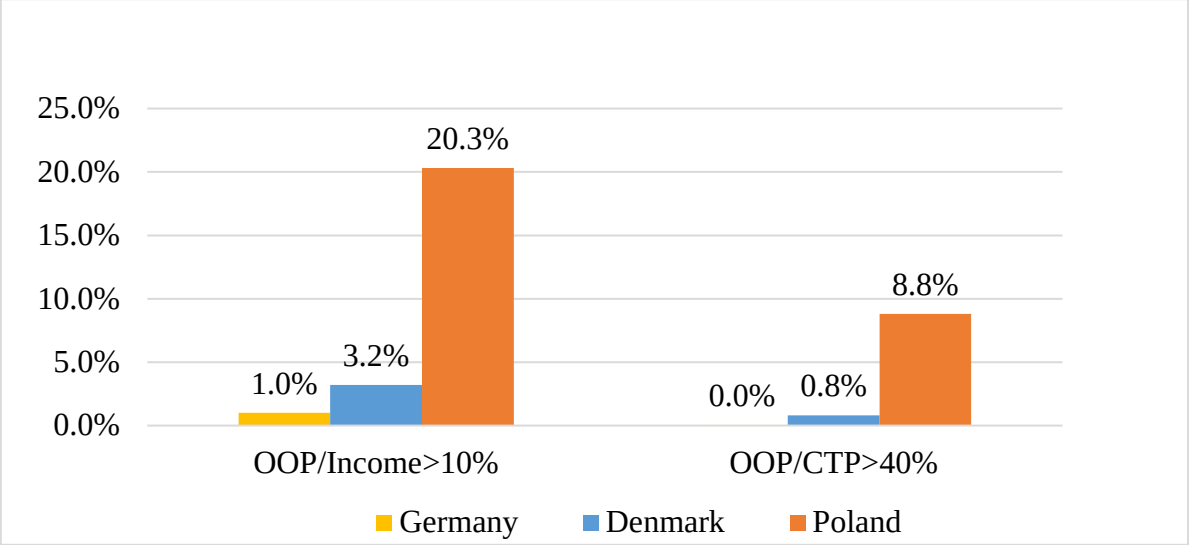


Source: Zawada A et al.

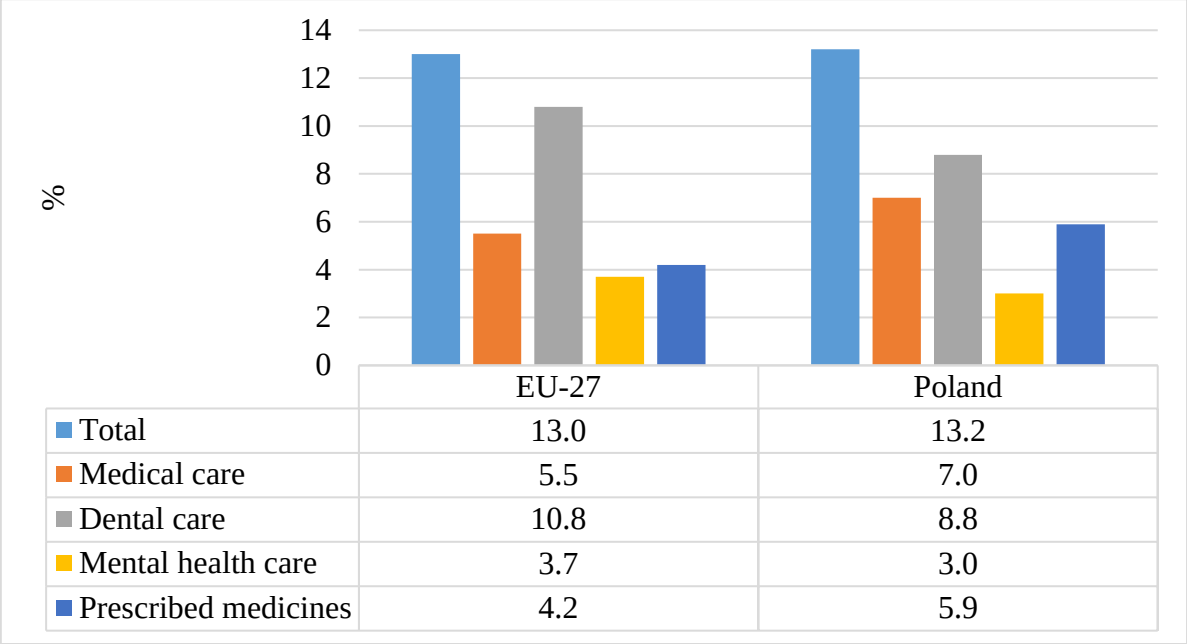
* Catastrophic out-of-pocket spending are presented here according to two different definitions of "catastrophic" spending: 10% of total income or 40% of capacity-to-pay (CTP).

11.2. Self-reported unmet needs for specific health care-related services[104]

As one can see on Figure 35, the percentages of people self-reporting unmet needs for specific health care-related services due to financial reasons in 2019 in Poland were lower than EU-27 average in terms of dental care and mental health care. In terms of prescribed medicines and medical care shares of people self-reporting unmet needs were higher in Poland than EU-27 average. Overall percentage of total self-reported unmet needs was a bit higher in Poland in 2019 than in EU-27 (a gap of 0.2 percentage points).

Figure 35. Self-reported unmet needs for specific health care-related services due to financial reasons, Poland and EU-27 average (2019)

[104] Eurostat https://ec.europa.eu/eurostat/databrowser/view/hlth_ehis_un2i/default/table?lang=en (accessed 20.08.2022)



	EU-27	Poland
Total	13.0	13.2
Medical care	5.5	7.0
Dental care	10.8	8.8
Mental health care	3.7	3.0
Prescribed medicines	4.2	5.9

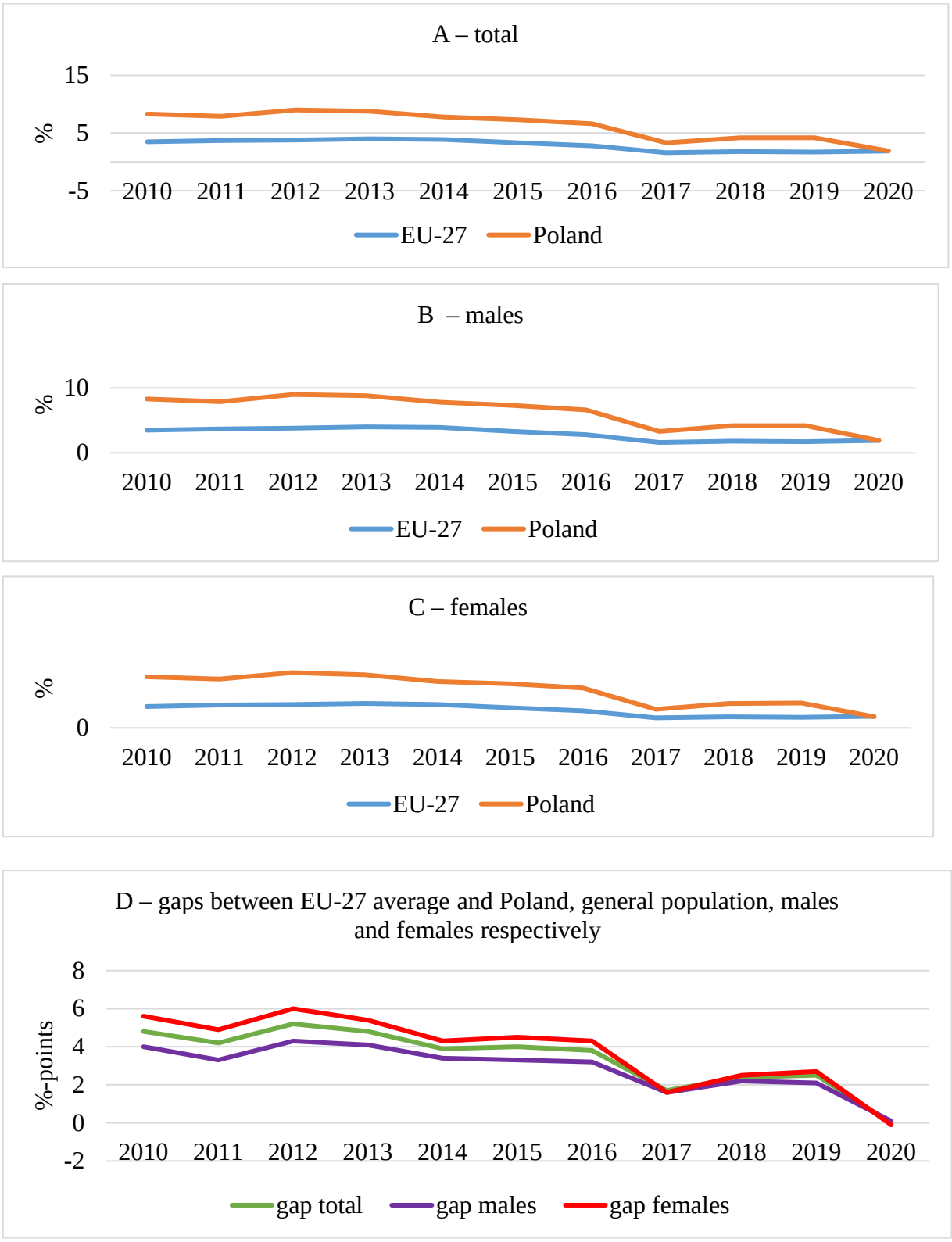
Source: Eurostat

11.3. Self-reported unmet needs for medical examination[105]

Self-reported unmet needs for medical examination in Poland has decreased between 2012 and 2020 from 3.5 to 0.4% (Figure 36). As for EU-27 average this indicator has also decreased, but not so fast as it has happened for Poland. Therefore, the shares of people self-reporting unmet needs became the same in Poland as EU-27 average in 2018-2019, but they have been lower in 2020 in Poland than EU-27 average. Comparing the gaps between Poland and EU-27 average unmet needs reported by the total population, men and women separately (Figure 36D) one can see that Polish women report more unmet needs than EU-27 average what is in line with findings on self-reported health and in contrary to measured health outcomes (see chapter 5.4 Share of people with good and very good health); in 2020 this trend for women changed.

[105] Eurostat https://ec.europa.eu/eurostat/databrowser/view/sdg_03_60/default/table?lang=en (access 15.08.2022)

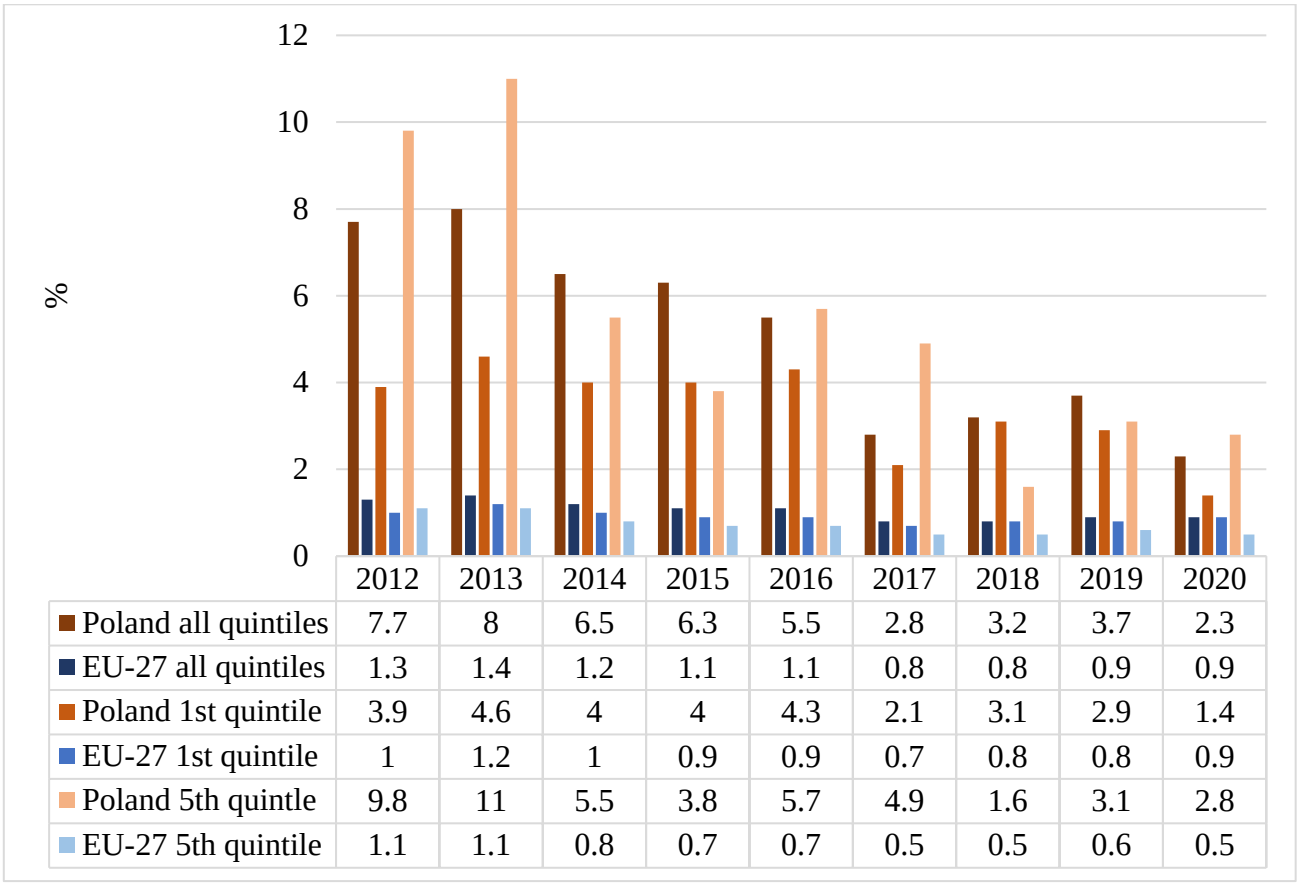
Figure 36. Shares of people with self-reported unmet needs for medical examination in Total population (A), males (B), females (C) Poland and EU-27, 2010-2020. D – gaps between EU-27 average and Poland for general population, males, and females respectively.



Source: Eurostat Health Data

As described in the previous chapter the waiting lists are the biggest issue for Polish patients, specifically the poorest ones. Analyzing a distribution of data on needs for medical examination due to waiting lists (Figure 37) one can see the overall trend declining year by year. However, in 2020 the differences between EU-27 average and Poland still exists accounted for 1.4 percentage points (0.5 in poorer and 2.3 in richer population).

Figure 37. Shares of people reporting the unmet needs for medical examination due to waiting lists (by income)



	2012	2013	2014	2015	2016	2017	2018	2019	2020
Poland all quintiles	7.7	8	6.5	6.3	5.5	2.8	3.2	3.7	2.3
EU-27 all quintiles	1.3	1.4	1.2	1.1	1.1	0.8	0.8	0.9	0.9
Poland 1st quintile	3.9	4.6	4	4	4.3	2.1	3.1	2.9	1.4
EU-27 1st quintile	1	1.2	1	0.9	0.9	0.7	0.8	0.8	0.9
Poland 5th quintle	9.8	11	5.5	3.8	5.7	4.9	1.6	3.1	2.8
EU-27 5th quintile	1.1	1.1	0.8	0.7	0.7	0.5	0.5	0.6	0.5

Source: Eurostat

11.4. New governmental initiatives to satisfy unmet patients' needs in the access to innovative drugs

In the face of growing expectations of the Polish patients there were some efforts to amend the law and create new mechanisms to stimulate pharma sector to more active reimbursement application. In

November 2020 the Act of 7 October 2020 on Medical Fund[106] (Journal of Laws, 2020, item 1875) came into force. The Medical Fund is a specific financial mechanism gathering funds for, among others[107]:

1. Prevention, early diagnosis, and treatment of non-communicable diseases, including cancers and rare diseases
2. Health care services for people under 18 years of age.
3. Services for Polish citizens needed health care while being abroad

AOTMiT plays an active role, taking the responsibility to prepare the evidence-based lists of technologies (as an advice to the Minister of Health):

2. The list of the technologies of high innovativeness (of 11 technologies at the AOTMiT list of 2021 MoH chose five[108]: Givlaari (givosiran) for acute hepatic porphyria, Dovprela (pretomanid) for drug resistant tuberculosis (MDR/XDR), Oxlumo (lumasiran) for primary hyperoxaluria type 1, Zolgensma (onasemnogene abeparvovec-xioi) for spinal muscular atrophy (SMA), Idefirix (imlifidase) for preventing rejection of a newly transplanted kidney)
3. The list of the technologies of high clinical value (of 35 technologies at the AOTMiT list of 2021 MoH chose 14[109])

The Minister of Health invited MAHs to provide reimbursement applications. However, MAHs still should apply sticking to usual rules. As for August 3rd, 2022, at the website of MoH there is an information on four applications from the first list (high innovative technologies) which have failed in the negotiations with Economic Commission in MoH[110] thus not placing their products at the reimbursement lists (the process failed).

[106] Ustawa z dnia 7 października 2020 r. o Funduszu Medycznym, Dz. U. 2020 poz. 1875 z pozn. zm. https://isap.sejm.gov.pl/
[107] https://www.gov.pl/web/zdrowie/fundusz-medyczny (access 3.08.2022)
[108] https://www.gov.pl/web/zdrowie/fmltowpi (access 3.08.2022)
[109] https://www.gov.pl/web/zdrowie/technologie-lekowe-o-wysokiej-wartosci-klinicznej-tlk (access 3.08.2022)
[110] https://www.gov.pl/web/zdrowie/fmltowpi (access 3.08.2022)

11.5. Unmet medical patients' needs – main conclusions

- **Self-reported unmet medical needs are measured in Eurostat EU-SILC households survey and refer to such needs during the previous 12 months. These data for general Polish population seem to be in the convergent trend as compared to EU-27 average, and – what is specifically intriguing in the light of health care outcomes and expenditure for Poland – the gap from 4.8% in 2010 came to 0 during COVID-19 pandemics (2020).**
- **However, when comparing the vulnerable population groups, namely the lower-income quintile as compared to the highest-income quintile, the gap of 6.8%-points between EU-27 and Poland (2019) in the poor people can be seen induced mainly by unmet needs for prescribed medicines (9.0 %-points) and medical care (6.7%-points).**
- **The biggest burden of unmet needs in Poland is caused by long waiting lists in 1st (8%-points gap between EU-27 and PL) as well as in 5th income quintile (5.8%-points gap); the next reason in 1st income quintile are financial issues (5.8%-points gap). The distance to the medical services provider is relatively low in the assessment.**
- **Detailed analysis of unmet health needs by the reason in over 65+ as compared to younger people revealed the biggest gap between EU-27 and PL due to waiting lists: 12.4%-points in over65+ population and 4.6%-points in younger ones as well as 5.8%-points gap due to financial reasons on over 65+ years of age.**
- **Self-reported unmet needs for specific health care-related services due to financial reasons, revealed the biggest gap between EU-27 and PL (1.7%-points) concerning the access to prescribed medicines.**
- **The overall trend of unmet needs for medical examination in Poland is similar to the one for general medical needs reaching the EU-27 level in 2020. However, analyzing the issue of waiting lists a gap between EU-27 and PL exists in 1st (0.5%-points) and in 5th income quintile (2.3%-points gap).**

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13. Appendix 1 . Econometric assessment of income elasticity

Over the last three decades, the issue of defining the relationship between health expenditure and GDP has been thoroughly investigated in the health economic literature. Through the years, several studies have indicated a statistically significant positive correlation between per capita health expenditure and per capita income; starting with the seminal 1997 paper by Newhouse that indicated that 90 percent of the observed variation in the per capita health expenditure can be explained by the variation in Gross Domestic Product (GDP) a number of subsequent studies adopted a demand function approach to estimate income elasticities through several econometric models.

Income elasticity of overall healthcare spending is found to exceed unity indicating that health care is a luxury good although newer evidence suggests that when differentiating between public and private expenditures, elasticities tend to be below and above one, respectively. However, the examination of the influence of income, as well as other factors at the national level yields different results, especially when diverse methods are used, most probably owing to differences in the organizational structure of health systems in the developed economies. In addition, according to OECD studies, the differences in results concerning income influence on health spending may reflect differences attributed to the time periods as well as different organizational and political structures of the health care system.

Data used in this study refer to the period 2002-2019. Data on health expenditure and per capita GDP in Poland come from OECD health data source accessed in 8th August 2022.

In an attempt to further investigate this phenomenon in Poland we make use of a simple double logarithmic model assuming the following form:

$$\text{Log (TPE)} = a + b \text{ Log (GDP)} + u \quad (1)$$

where:

TPE = Total (public and private) Pharmaceutical Expenditure per capita,

GDP = Gross Domestic Product per capita,

a and b = parameters to be empirically assessed,

u = Error Term.

The econometric findings of the above model are shown in Table App 1 indicating a statistically significant relationship between pharmaceutical expenditure and GDP. The estimated value of the

coefficient of determination R^2 shows that the empirical models can explain more than 98% of the evolution of pharmaceutical expenditure in Poland. The value of t-Statistic t=30.15 indicates a high statistical estimate for the value of income elasticity e=0.63.

Table App 1. An income elasticity of demand for pharmaceutical expenditure in Poland, 2002-2019; a double logarithmic model

Dependent Variable: PHAL
Method: Least Squares
Sample (adjusted): 2002-2019
Included observations: 18 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.414438	0.205915	-2.012668	0.0613
GDPL	**0.624957**	0.020723	30.15737	**0.0000**

R-squared (R^2)	0.982711	Mean dependent var	5.791996
Adjusted R-squared	0.981631	S.D. dependent var	0.213591
S.E. of regression	0.028949	Akaike info criterion	-4.142152
Sum squared resid.	0.013408	Schwarz criterion	-4.043221
Log likelihood	39.27936	Hannan-Quinn criter.	-4.128510
F-statistic	909.4670	Durbin-Watson stat	1.265763
Prob(F-statistic)	0.000000		

The interesting finding of the above relationship is that the estimated income elasticity is lower than one (elasticity is 0.63 < 1) indicating that a 100 percent increase in GDP would lead to 63 percent increase in pharmaceutical expenditure. The value of the estimated elasticity for Poland is also supported by a great number of researchers reporting similar findings. One of the latest being e. g. *Vargas Bustamante A, Shimoga SV. Comparing the income elasticity of health spending in middle-income and high-income countries: the role of financial protection. Int J Health Policy Manag. 2018;7(3):255–263. doi:10.15171/ijhpm.2017.83*

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14. Research Team

Anna Zawada, MSc, PhD(c)

Graduated from Warsaw University, the Faculty of Mathematics, Informatics and Mechanics. Her professional experience covers developing software for medical equipment, editing, and managing Polish branches of American medical journals, managing and leading European Commission co-financed projects. PhD candidate in Medical University of Warsaw. She has over 16 years' experience at health technology assessment field, working for AOTMiT from the positions of HTA analysts up to the director of Transparency & Tariff Councils Office. As the representative of AOTMiT she led AOTMiT involvement in EUnetHTA JA2, JA3 and Advance-HTA EC co-funded projects and represented AOTMiT in ISPOR Europe HTA Roundtable and at INAHTA Congresses. She supported EUPATI project. Her other activities involve the ones of HTA educator at Medical University of Warsaw (MUW; 2 years' MSc studies in HTA as manager and lecturer in 2019-21 among others) and Warsaw University of Technology Business School and HTA researcher at MUW (the main subjects: health inequities, horizon scanning). An expert in the project HB-HTA.pl (hospital-based HTA). She gained an experience as a lecturer for international audience. She is currently the Associate Editor for International Journal of Technology Assessment in Health Care as well as a reviewer in many international journals (BMJ, Health Policy, Heart, ViHRI, IJTAHC, IJHPM), reviewer of abstracts/workshops for ISPOR and HTAi conferences.

Malwina Hołownia-Voloskova, MPharm, BSc, PhD(c)

Graduated from Warsaw Medical University, the Faculty of Pharmacy and Warsaw University, the Interfaculty Studies on faculties of Applied Linguistics, Management and Journalism. Her professional experience began with an internship in the Polish Agency of Health Technology Assessment and translating scientific literature on healthcare, as well as interpreting during international conferences from Polish and English to Russian. After a masters' thesis on comparison of Russian, German and UK drug reimbursement systems, she was invited to work as a health economist in the Russian chapter of International Society for Pharmacoeconomics and Outcomes Research. After a few years, she has worked as health economist in scientific institutes in Moscow, being head of health technology assessment department in one of them. She is an experienced speaker of international events, including ISPOR European conferences and international congresses. Since 2017, she is working on her PhD in Warsaw Medical University on health-related quality of life. She is an author of over 100 publications, including those on MCDA, rare diseases, health technology assessment in various fields of medicine, health-related quality of life and risk-sharing schemes.

PROFESSOR JOHN YFANTOPOULOS D.Phil. University of York

President of IPOKE Research Institute *(www.ipoke.gr)*

John Yfantopoulos is Emeritus Professor of Health Economics at the University of Athens, President of IPOKE Research Institute, President of the ISPOR the Greek Chapter, former President of the National Centre for Social Research and an elected member of the Senate of the University of Athens, He was a keynote Speaker in several European meetings during the 2014th Greek Presidency in the European Commission and the European Parliament. He received his Doctor of Philosophy in Health Economics from the University of York, UK. Professor Yfantopoulos has extensive teaching and research experience in Health Economics, Health Technology Assessment (HTA) and Pharmaco-economics in Europe and the USA. He collaborated with several Universities in Europe, and the USA He has been working and advising the European Commission, (Eurostat), the World Health Organization, the International Labor Office, and the World Bank. He was the elected Rapporteur of the 23rd WHO Regional Office for Europe and the elected Chair of the 11th European Congress of ISPOR. In November 2008, he was awarded the ISPOR Distinguished Service Award. He has extensive experience with the Eurostat data sources (HBS, LFS, ECHP, SILC, EHIS) as well as with the EU Research Projects like SHARE and the (European Social Survey, (ESS)). In 2005 in the evaluation of the Greek research centers from an international peer review committee, he received the highest grade (excellent (5)) for his scientific work, commitment to international collaboration and research networking. Recent activities in a number of Eastern European countries, Russia, Bulgaria, Romania, Poland, Moldova, Albania include studies in the evaluation of economic efficiency, health technology assessment, pharmaco-economics, and implementing effective health reforms. He has published 39 books, as well as more than 300 articles in international refereed journals.