



Polish Healthcare Industry Report

Facing challenging landscape

BLACKPARTNERS
TO SEE THE INVISIBLE. TO DO THE IMPOSSIBLE.

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Executive summary

Healthcare industry in Poland is entering an exciting, yet demanding period, as demographic, financial, operational and regulatory changes will pose both great opportunities and challenges for the entire sector.

Ageing population will have weighty consequences for Poland's healthcare system, causing both an increased demand for health care services, as well as transformation of the market structure. Poland's population continues to be the fastest ageing society in Europe, with the number of people aged 65 or older expected to grow by more than 2mn in the next decade, reaching over 21% of the entire population. Yet, existing system is poorly adjusted to the care that older populations require and will be forced to employ significant changes and efficiency enhancing policies to address increased demand, while being constrained by limited financing.

We expect the industry to grow on average by 4.2% on annual basis, to reach PLN 140bn in 2020. Growth should be propelled by demographic changes, rising wages, intensification of lifestyle related diseases and increased popularity of private health insurance/subscription plans. We believe, that public spending on healthcare will also increase, however to lesser extent than recently announced by the Ministry of Health, due to difficult budgetary situation.

In our opinion, legislation will be a major risk factor in upcoming years, especially for private healthcare providers. We fear that the proposed creation of "hospital network" will restrict access of private entities to public contracts, resulting in decreased competition and quality of care. However, we appreciate the idea to replace current insurance based system with a tax based one. With a negligible fraction of population not entitled to health insurance, elimination of the insurance system will provide significant cost savings and simplify the system. We are also pleased that the proposed reform addresses a worldwide trend of treatment reorganization and changes in business model. The tendency to shift procedures from inpatient to outpatient care, more common use of telemedicine and introduction of coordinated care, will enable a more productive use of resources, as well as faster, comprehensive and cheaper treatment.

Among other risks, we are deeply concerned with the shortage of qualified personnel. With only 2.2 practising physicians per 1000 inhabitants, Poland lags behind the rest of EU countries. Moreover, the situation is forecasted to become even worse, as majority of physicians is of considerate age and the supply of new doctors is constrained by small admission limits at medical universities and increasing willingness of young physicians to seek employment in Western Europe.

Nevertheless, we believe that the healthcare industry enters a very interesting period. Healthcare providers will have to come up against considerable challenges, however, those most adaptable and able to forecast the direction of future market developments, will benefit from the opportunities this sector provides.

Market overview

Market size

The healthcare industry continues to grow steadily, despite regulatory and political uncertainty, as well as considerable bureaucratic burden. Its size almost doubled since 2006, reaching over PLN 114bn in 2015, according to the Polish Central Statistical Office.

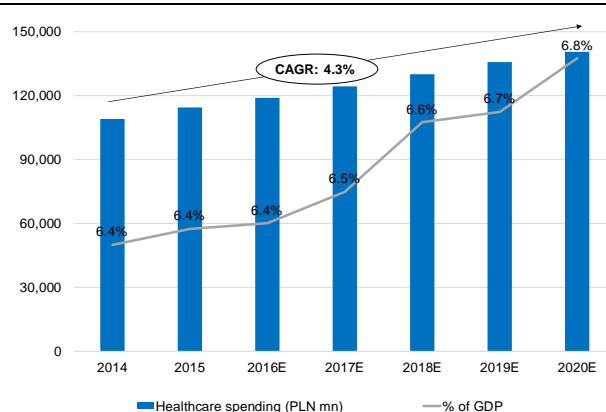
We believe that the sector will maintain its growth potential in the foreseeable future, approaching a value of PLN 140bn by 2020. The main growth drivers supporting our estimates include:

- Solid macro fundamentals of the Polish economy, with forecasted GDP rising by 3.0-4.0% during the estimation period.
- Continuous increase in Poles' purchasing power, with wages up by 3.7% in 1Q16 year over year. Economists' forecasts indicate that wages will rise quicker than GDP in forthcoming years, especially in large urban areas.
- Progressive process of population ageing, with the share of over 65-year-olds reaching 18% by 2020.
- Rising health awareness and intensification of lifestyle-related diseases.
- Expansion of private health insurance schemes, both individual and collective.

KEY MARKET INDICATORS

	2015	2016E	2017E	2018E	2019E
GDP growth	4.1%	3.2%	3.5%	3.3%	3.3%
GDP per capita (PLN)	46,546	49,093	51,241	54,141	57,266
Healthcare spending (PLN bn)	114.6	119.1	124.3	130.2	135.7
% of GDP	6.4%	6.4%	6.5%	6.6%	6.7%
Pharma spending (PLN bn)	33.4	34.8	36.3	38.1	40.0
Population (mn)	38.5	38.5	38.5	38.5	38.5
% of over 65y olds	15.2%	15.7%	16.3%	16.9%	17.5%
Life expectancy at birth	76.8	77.1	77.3	77.5	77.6

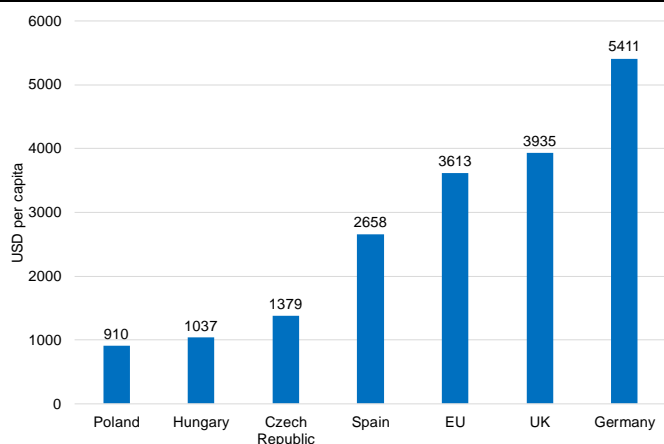
HEALTHCARE SPENDING IN POLAND



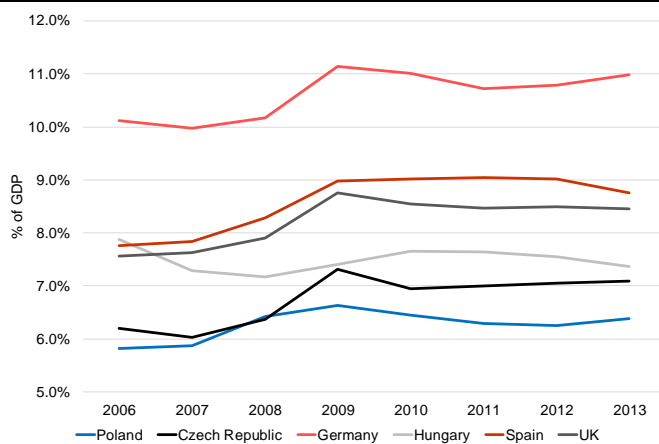
Source: OECD, Blackpartners, Central Statistical Office, The Economist Intelligence Unit

With a CAGR 2014-2020 of 4.3%, we estimate that healthcare spending will approximate 6.8% of Polish GDP in 2020. Current share of 6.4% remains below the level observed in other countries. In the EU, only Luxembourg and the Baltic states spend smaller fraction of their GDP on healthcare, with Sweden, Germany and France allocating over 11%.

SPENDING PER CAPITA IN SELECTED COUNTRIES, 2014



HEALTHCARE SPENDING IN SELECTED COUNTRIES



Source: World Bank, OECD, Blackpartners

Spending in USD terms still persists on lower levels than in other EU countries; only Romania and Bulgaria spent less (556 and 661 USD respectively). However, per capita expenditure should exhibit even higher growth rates than the aggregate market, due to declining population.

In its financial plan for 2017 National Health Fund (NFZ) projects PLN 77bn of revenues, out of which 95% will be spend on healthcare, PLN 3.8bn increase yoy. However, various experts raise concerns whether this value is feasible. Even though, unemployment reached historical lows in 2Q2016, recently introduced 1. “Rodzina 500+” programme, 2. proposed lowering of the retirement age and 3. ongoing population ageing, may negatively affect the amount of active labour force. Even increasing salaries, may not offset the decline in the number of contribution payers. Resulting divergence in revenues and expenditure of the public insurer might require a decrease in valuation of health benefits in medium to long term and as a consequence reduce margins in the industry.

However, ruling Law and Justice party (PiS) favours a shift from insurance-based to tax-financed healthcare system. Current Minister of Health recently proposed a project that involves liquidation of NFZ and replacement of healthcare contributions with mandatory tax. This, in view of the Ministry, will ensure a common access to healthcare for all inhabitants, not only those who are insured. Moreover, the Ministry aims at increasing public spending on healthcare from current 4.4% of GDP to 6%. Yet, according to the proposal, only healthcare facilities belonging to the so called “network” will be eligible for public funding. Having in mind current government’s attitude, we share market’s anxiety that private entities may be left out of the “network”, and therefore deprived of access to public contracts.

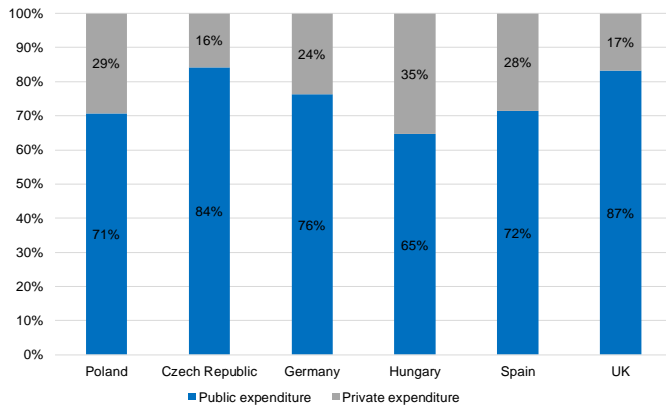
Market structure

The Polish healthcare sector is dominated by public financing schemes, which accounted on average for about 70% of total spending in the last 10 years, based on Central Statistical Office data. Financing mix should shift in favour of private spending in upcoming years, as PMR estimates its 2016-2021 CAGR at around 7.0%.

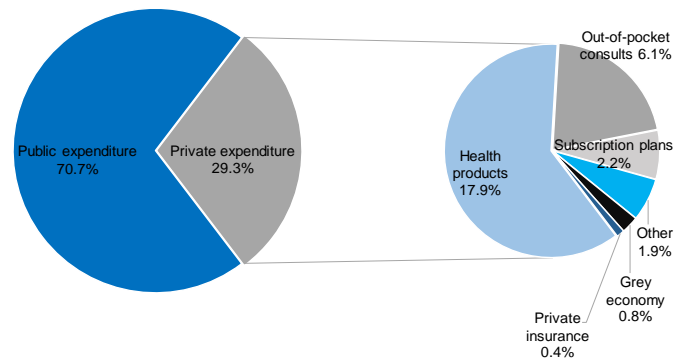
Out-of-pocket spending comprises most of private expenditure, mostly on pharmaceuticals and medical equipment. According to PMR, subscription plans and private insurance schemes will be leading segments in terms of growth, experiencing double-digit increases in the next two years. Boost

in subscription plans will still be mostly driven by corporate demand, while rapid surge in private insurance schemes is for the most part a result of low base effect. In addition, PMR points out significant potential on FFS (fee-for-service) segment. Enel-Med and LUX Group recently introduced FFS offers for clients not covered by subscription plans. The offer is still being developed, however, dynamics in revenues give high hopes for the future.

FINANCING STRUCTURE IN SELECTED COUNTRIES



EXPENDITURE STRUCTURE

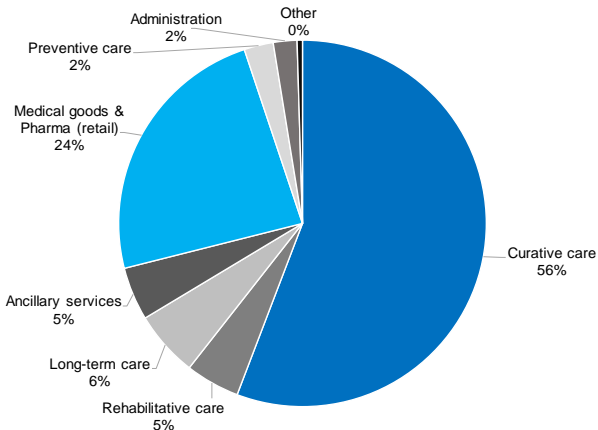


Source: Central Statistical Office, OECD, Blackpartners

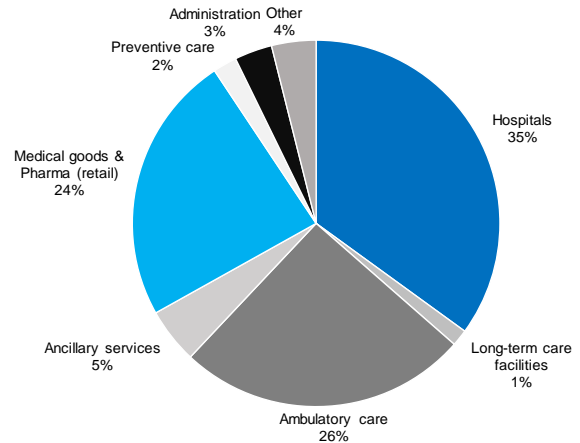
Curative care represents the largest fraction of all healthcare expenditure, collecting over 55% of total spending, with over 80% financed by public schemes. Rehabilitative, preventive and long-term care, yet small in total value, experience meaningful upsurge. We believe this trend to continue, propelled by the reorientation of health policy from treatment to prevention and ageing population.

As far as healthcare providers are concerned, hospitals are the biggest benefactors in the entire sector collecting over 35% of total spending (PLN 37bn in 2013), not surprisingly mostly financed by public sector (96%). Ambulatory care providers collected a hefty share of 26% (PLN 27bn), with dental practices claiming more than PLN 4bn and private medical practices PLN 2bn of the aforementioned value. As expected, while the entire ambulatory care segment is financed mostly by public resources, the dental subsegment relies almost entirely on private spending.

EXPENDITURE BY FUNCTION



EXPENDITURE BY PROVIDERS



Source: Central Statistical Office, Blackpartners

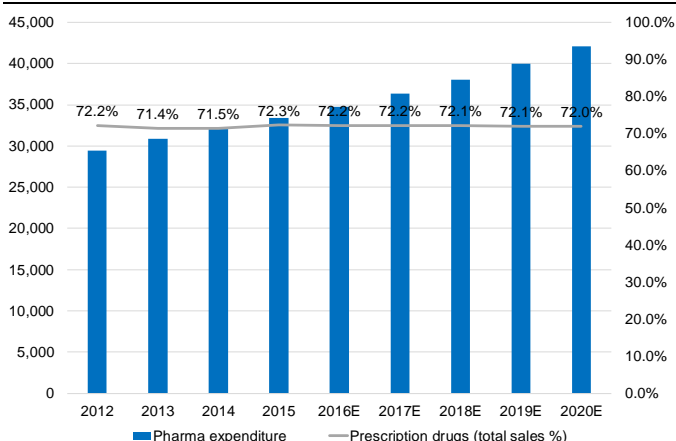
Pharma market

Sales of pharmaceuticals encountered significant turmoil in 2012, after introduction of the new act on the reimbursement of medicines, as sales of reimbursed drugs plummeted by 19.6% in 2013 compared to 2011. The new bill caused a shift in the segment structure, resulting in pharmaceutical companies to focus on non-reimbursable drugs, as a way of limiting losses.

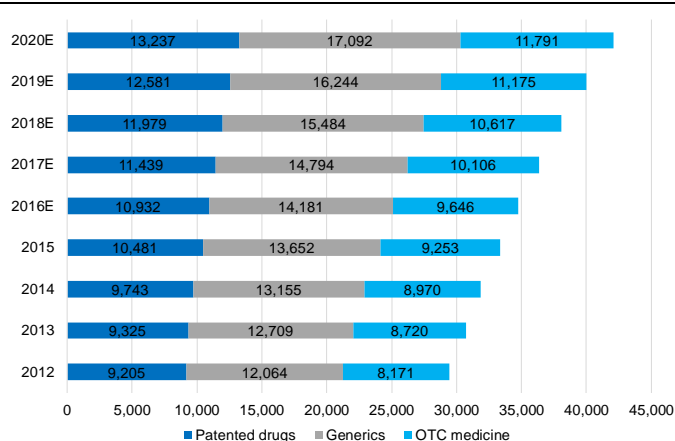
Still, in spite of numerous short-term risks, Polish pharmaceutical market should enjoy solid growth in the future, driven by ageing population and wage increase. BMI expects the pharma sales to reach PLN 34.8bn this year, up by 4.1% yoy. During the 2016-2020 period the market will realize a 4.8% CAGR, reaching PLN 42.1bn in nominal terms.

In its report, BMI valued the prescription drug segment at PLN 24bn in 2015 and believes the segment to grow by 4.7% annually to reach PLN 30.3bn by the end of 2020. The segment should decline in terms of share of the total market, driven primarily by rising spending on OTC drugs and increasing co-payments for reimbursed medicine.

PHARMACEUTICAL SALES, PLN MN



PHARMACEUTICAL SALES STRUCTURE, PLN MN



Source: EGA, AESGP, BMI, Blackpartners

Moreover, we believe that higher demand induced by ageing population, along with limited resources of the NFZ may force the national insurer to further cut margins on prescription drugs on the reimbursement list.

Presently, most of patented drugs in Poland that are on the reimbursement list require significant co-payments from the patients. Long-lasting preference of the Polish authorities for low-cost treatment and generics has limited the potential of expensive, innovative drugs. However, increasing emphasis on prevention rather than treatment, more specialized treatment and observed switch in the reimbursement policy, demonstrated by the addition of more and more patented drugs to the list, let us believe that the segment will grasp a larger fraction of the market. EFPIA valued sales of patented drugs at PLN 10.5bn in 2015, 31.4% of total pharmaceutical sales. Through 2020, BMI estimates that the segment will gain 4.8% on annual basis arriving at over PLN 13bn.

Poland is one of the leading European countries with regard to generic drug saturation, with the segment claiming over 40% of the market. This phenomenon has been historically driven by low

purchasing power of the population and government inclination for cheaper medicine. However, as we mentioned above, rising importance of patented drugs should slightly shrink the share of generics in the market. Still, the segment valued by European Generics Association (EGA) at PLN 13.7bn in 2015, should experience moderate growth, with CAGR 2015-20 of 4.6%

As far as over-the-counter (OTC) drugs are concerned, the segment should grow steadily in the foreseeable future, driven by rising wages, shift to self-medication and smaller reliance on regulatory environment. Association of the European Self-Medication Industry (AESGP) estimates the segment sales at around PLN 9.3bn, while BMI forecasts a 5.0% annual growth through 2020.

Since the accession to the European Union, Poland has experienced enormous increase in pharmaceutical trade, evidenced by exports boosting from PLN 722mn to PLN 11.7bn during the 2003-2015 period. Moderately advanced manufacturing facilities, along with low-cost production remain the comparative advantages of Polish pharmaceutical companies. However, due to strict regulation concerning clinical trials and resulting limitation on the creation of innovative drugs, vast majority of exported drugs are generics, low-cost substitutes of more sophisticated pharmaceuticals. Still, prospects for manufacture remain solid, as BMI projects exports to increase with a CAGR of 6.9%, reaching PLN 15.6bn in 2020.

Demography & Health status

Population overview

Since 1989 Poland has undergone a major shift in the demographic behaviour of its population, which led to important changes in the demographic structure of the country. Favourable trends in the mortality levels are accompanied by changes in fertility patterns, and growing importance of international migration only strengthens negative transformation of the population structure.

Compared to other EU countries, Poland is still a relatively young country. According to Eurostat data, the median age of Polish population in 2013 was 38.6, while the same indicator on the EU level reached 41.9. However, negligence of public authorities in the area of demographics and refusal to address the challenges posed by demography leads to further distortion of the population structure. Eurostat and Polish Central Statistical Office forecast that after 2024 the fraction of over 65-year-olds in the population will exceed 20% (up from current level of 15.2%), while in 2060 the share of elderly population will reach 33%. We note that these projections were made assuming an increase in future total fertility rate (TFR), decrease in job market entering age and higher female employment ratio. In our opinion, latest legislation including inter alia: postponement of entrance age to primary education, lowering of the retirement age and other social programmes make these projections more or less optimistic.

KEY DEMOGRAPHIC INDICATORS

	2015	2016E	2017E	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E
Population (ths)	38500	38490	38475	38453	38426	38391	38346	38290	38225	38149	38062	37967
% of women	51.6	51.6	51.6	51.6	51.6	51.6	51.6	51.6	51.6	51.6	51.6	51.6
over 65-year-olds	15.2%	15.7%	16.3%	16.9%	17.5%	18.0%	18.7%	19.3%	19.9%	20.4%	21.0%	21.4%
Total number of over 65-year-olds	5855	6056	6273	6490	6710	6926	7156	7375	7593	7795	7975	8117
Rate of natural increase	-0.1%	-0.1%	-0.1%	-0.1%	-0.1%	-0.1%	-0.2%	-0.2%	-0.2%	-0.2%	-0.2%	-0.2%
Life expectancy at birth	76.8	77.1	77.3	77.5	77.6	77.8	-	-	-	-	-	-
male	72.7	73.1	73.3	73.5	73.7	73.9	-	-	-	-	-	-
female	80.9	81.1	81.3	81.4	81.5	81.7	-	-	-	-	-	-

Source: Eurostat, Central Statistical Office, Blackpartners

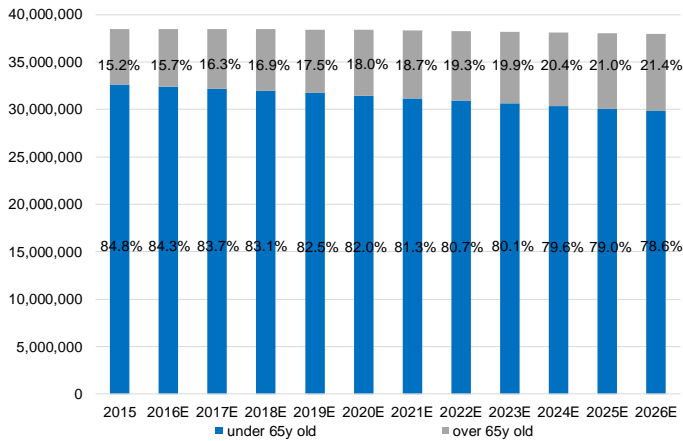
Following transformation, we observe a significant decline in TFR, which at current level of 1.2 is way below the replacement rate, and a rising mean age of childbirth for women. Unfavourable fertility tendencies will pressure further decline in population, with the number of Poles dropping by almost 600k until 2026. Central Statistical Office estimates that negative trends will intensify in the long-term, causing the population to arrive at 33.9mn in 2050.

The ageing of population is widespread and irreversible. Noticeable changes in the population structure emerged in the nineteenth century in Western Europe (UK, Sweden, Denmark, France), with the socio-economic advancement caused by industrialization, urbanization and improvements in healthcare. TFR in many European countries has remained low (below 1.5) or very low (below 1.3)

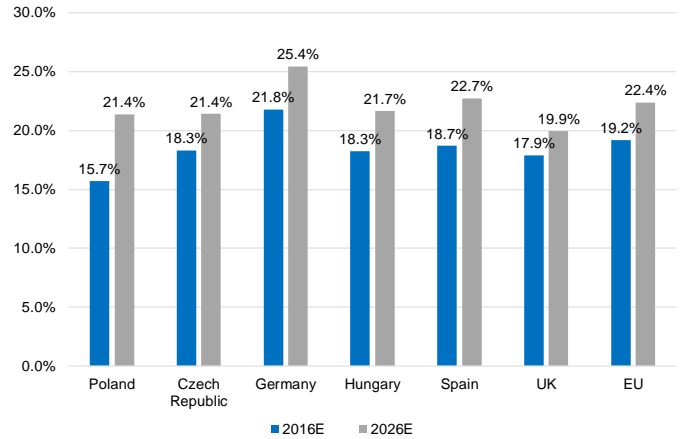
for a long time and the birth rates have stabilized at a very low (or even negative) level. Low fertility means fewer births and fewer potential mothers, which together with favourable changes in mortality

translates into a greater number of older people in the population. In the European context, Poland is still a rather young country with median age of 38.6 (41.9 in the EU) and fraction of elderly population at 15.2% (19.2% in the EU). Unfortunately, Poland has one of the fastest ageing societies and the Central Statistical Office estimates that the number of over 65-year-olds will hike from 5.9mn to 8.1mn during the 2015-2026 period to reach 21.4% of the entire population. By 2050, Poland will become one of the oldest societies in Europe.

POPULATION AND STRUCTURE PROJECTION



FRACTION OF OVER 65Y-OLDS IN SELECTED COUNTRIES

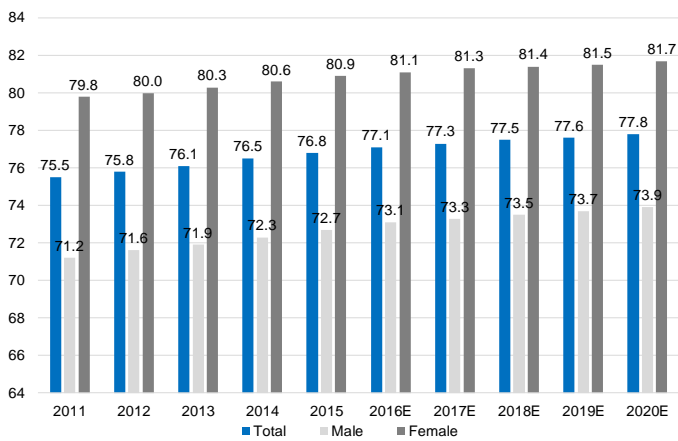


Source: Central Statistical Office, Blackpartners

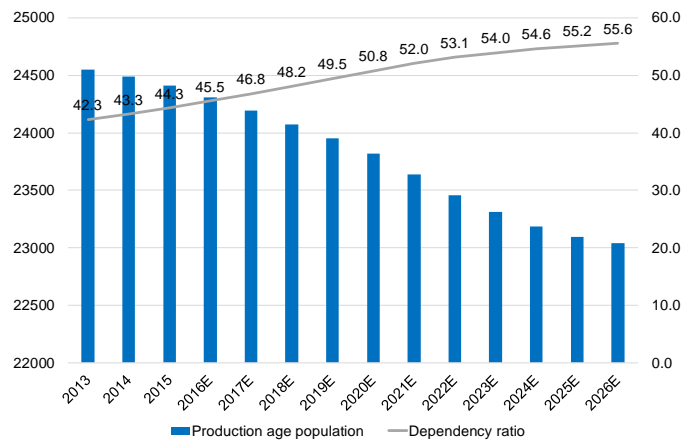
Ageing population will permanently change the shape of socio-economic environment and situation in healthcare. The burden of labour force will spike significantly, as production age population declines by 1.5mn through 2026, causing the dependency ratio to increase by more than 10 p.p.

These developments will have profound impact on the healthcare industry. We believe that rising fraction of elderly population will positively affect the demand in the sector. Geriatrics, rheumatology, cardiology and rehabilitation should particularly prosper thanks to increased demand. On the flip side, we are deeply concerned about the financing side. As we mentioned above, declining labour force will become increasingly overburdened to keep the system financially afloat. Yet, examples of older societies such as Germany or Sweden, which allocate over 10% of their GDP to healthcare, demonstrate that the system can be sustainable, however, in our opinion, the case of Poland will require far-reaching increase in efficiency and employment of cost-cutting measures.

LIFE EXPECTANCY AT BIRTH IN POLAND



DEPENDENCY RATIO



Source: Central Statistical Office, Blackpartners

Health status

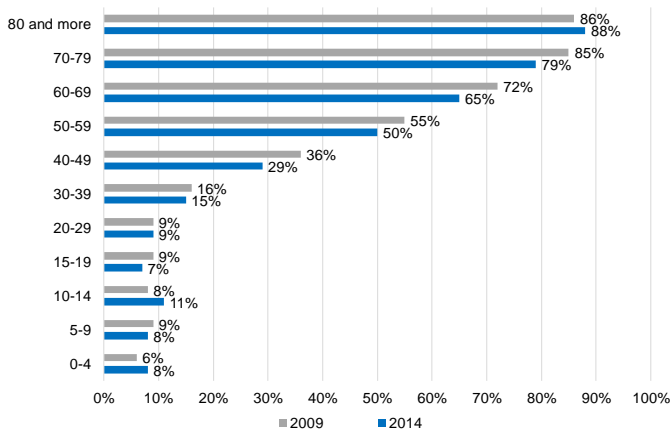
Over the last few years, a subjective health assessment of Polish citizens has slightly improved. According to the European Health Interview Survey (EHIS) results, in 2014 less than 34% of Poles described their health as worse than “good”, exhibiting minor improvement compared to 2009 and 2004 (respectively 34% and 39% of such responses).

In general, despite the improvement in the health status of Poles, it is worth mentioning that less than two thirds of people aged 15 and older described their health as good or very good, compared to more than 75% in the Netherlands, Cyprus, Norway or Belgium and more than 80% in Switzerland and Ireland. In the EU, only residents of Lithuania, Latvia, Estonia, Hungary, Croatia and Portugal described their health as worse.

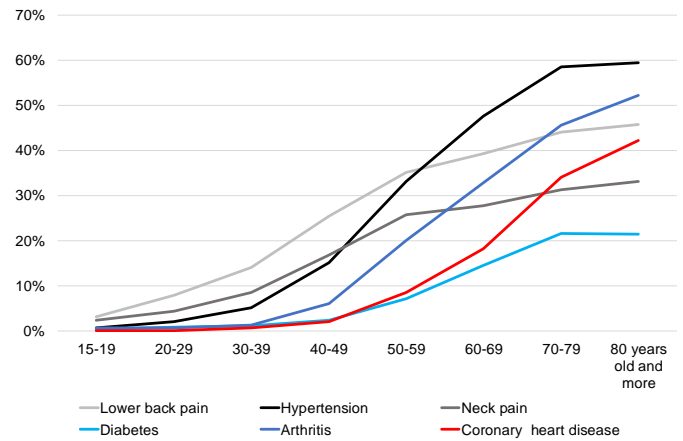
As reported by the EHIS results, more than half of Polish residents experience long-term health problems or chronic diseases, lasting at least 6 months. The incidence of such problems, as expected, increases with age. While among young people (under 30 years) long-term health problems are uncommon (20-25%), among older people (especially after the age of 60) – they become very common. More than 70% of 50-year-olds signalled occurrence of such problems, with the proportion rising to 85% among 60-year-olds. Women are relatively more susceptible to chronic diseases, with 57% reporting such issues, compared to 47% for men.

The most common ailment among adults is backache, suffered by more than 25% of women and 20% of men. Hypertension is also among the top issues, reported by nearly every fourth adult. Another top picks include inter alia: osteoarthritis, migraines, coronary artery disease, allergies, thyroid diseases and diabetes. Analysing by sex, EHIS results show that women are more prone to hypertension, osteoarthritis, thyroid disease and migraines, whereas men are far more likely to suffer from heart attack and strokes (and their chronic consequences), as well as from liver cirrhosis.

HEALTH STATUS REPORTED AS WORSE THAN "GOOD" BY AGE



DISEASE OCCURANCE BY AGE

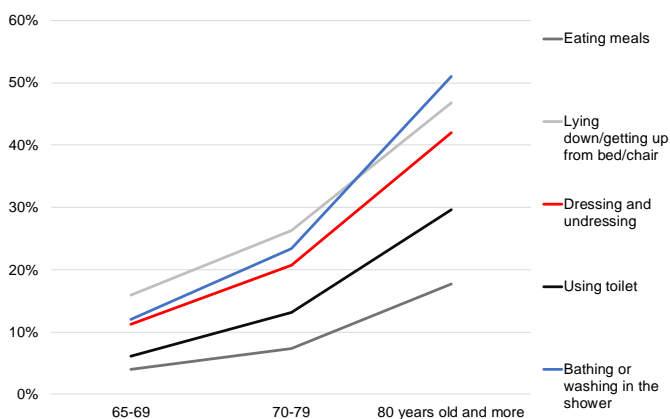


Source: Central Statistical Office, EHIS, Blackpartners

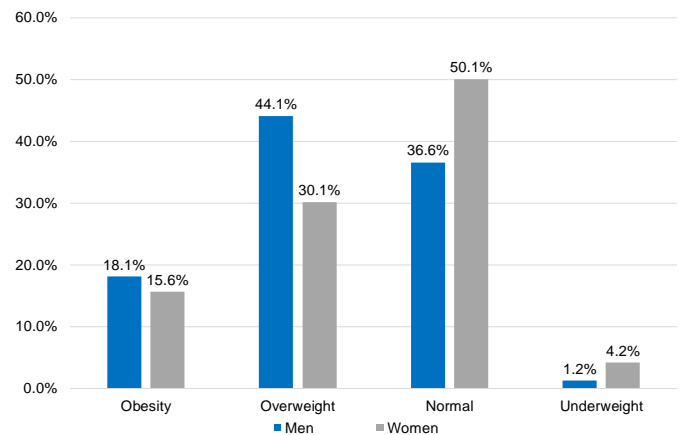
As ageing progresses, we observe a significant reduction in the efficiency of sensory and locomotor systems. In 2014, over 50% of adult Poles used glasses or contact lenses and nearly 5% used hearing aids or had a cochlear implant, while over 10% had trouble hearing. 13% of EHIS respondents reported difficulty in passing a distance of 500m without help or special equipment.

According to the Central Statistical Office data, more than 1.6mn people aged 65 or older had trouble lying down and getting out of bed or sitting down/standing up from a chair. Also, nearly 1.6mn people had a problem with self-washing or undressing. Over 500k people reported difficulties when using the toilet or even while eating. Nearly half of elderly population with these daily routine or self-service difficulties had to overcome them on their own, while 40% of this group reported the need for assistance. In our opinion, the demand for specialized elderly care will experience further growth with progressing ageing of the population and changes in parent-child relation.

REPORTED SELF-SERVICE DIFFICULTIES



BODY WEIGHT BY SEX



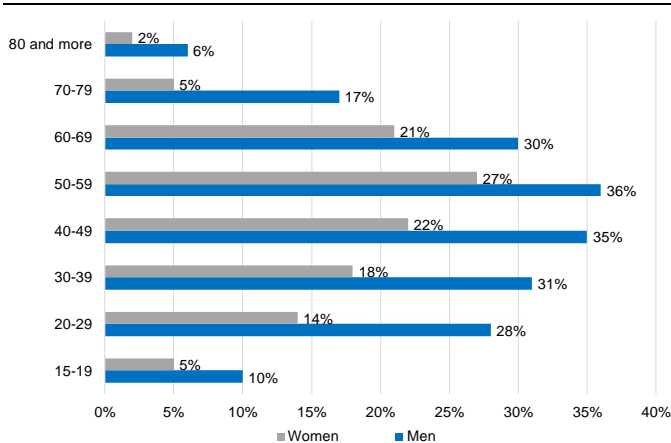
Source: Central Statistical Office, EHIS, Blackpartners

Obesity remains one of the biggest threats to the health, causing or encouraging the development of hypertension, coronary heart disease and many others. According to the EHIS results, since 2009 the fraction of overweight or obese adult men has increased by 1p.p. At the end of 2014, more than 62% of men had problems with weight (44% were overweight and 18% had obesity). Excess weight relates mainly to middle-aged and older men. In case of women, there is also a slight deterioration, with 46% having problems (30% overweight and 16% obese).

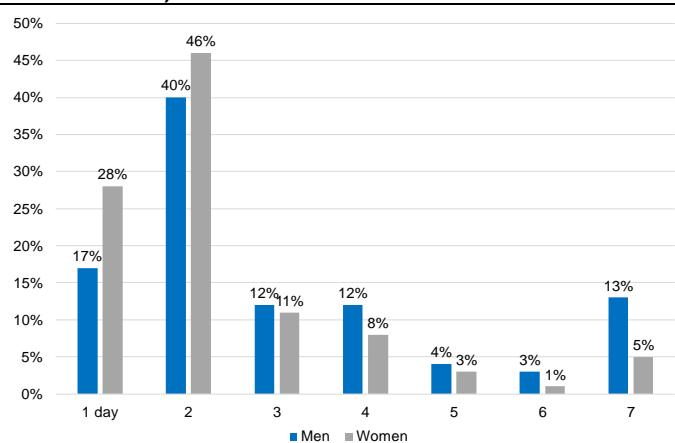
Smoking is becoming less and less popular. The share of smokers fell to 26%, compared to 29% in 2009. The proportion of male smokers diminished by 2 p.p. from 31% to less than 29%, while among women from 18% to 17%. The most common daily smokers were people aged 30-59 years.

Moreover, we observe a decline both in the number of alcohol users and in the frequency of drinking. 28% of Poles describes themselves as abstinent (down by 2 p.p. since 2009), with most drinkers aged 20-49 years.

DAILY SMOKERS BY AGE GROUP



ALCOHOL DRINKING DAYS PER WEEK (EXCLUDING ABSTINENTS)



Source: Central Statistical Office, EHIS, Blackpartners

Only one in fifteen adult Poles has never been examined by a medical personnel for blood pressure levels, and most such cases occurred among the youngest group age. Almost 2/3 of the adult population have had a blood pressure test performed recently, with those in poor health condition attending those tests on a frequent basis.

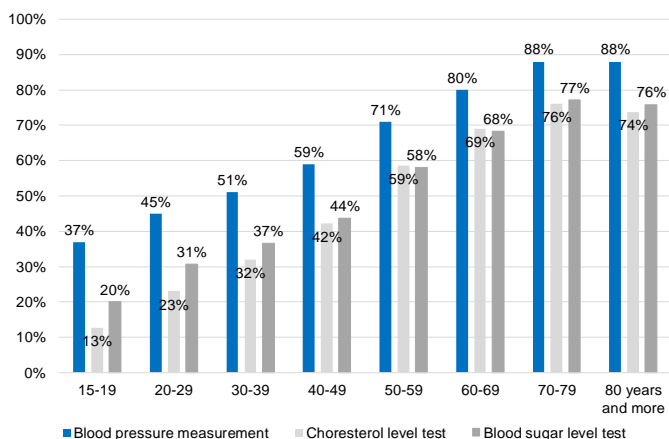
Central Statistical Office reports also increased frequency of blood testing for cholesterol levels. 75% of the adult population had this test performed at least once in their lifetime, with 47% of this group in the recent year. Moreover, testing of blood sugar level becomes a standard in the prevention of diabetes. Only 25% of adult Poles have never had this test performed, compared to 33% in 2009. Nearly half of the population has been tested for diabetes in the past 12 months, and in the case of older people up to 70%.

As far as cancer prevention is concerned, more than 85% of Polish women have ever had a pap test (cytology), up by 6 p.p. compared to 2009. The remaining 15% comprise mostly of young women and those aged 70 or older. We note that the lower percentage of these tests among older women is particularly worrisome, as they are relatively more threatened by cervical cancer. In case of

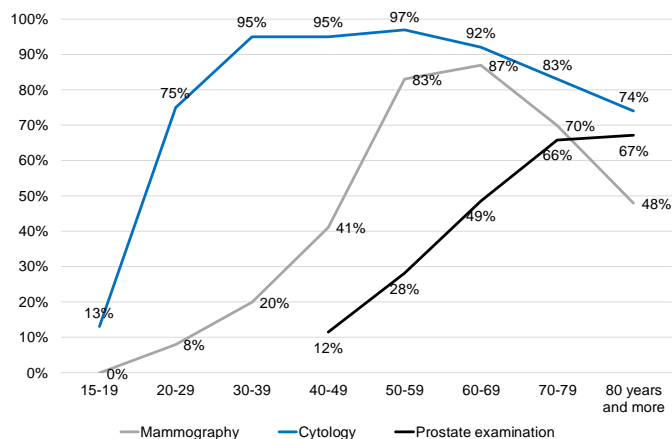
mammography, we observe a further increase in prevalence. Central Statistical Office reports that around 50% of women have at least once taken this test, an increase of 7 p.p. since 2009. According to the data 41% of all mammography tests are due to the implementation of the free-access mammography programme.

As regards men, the prevention is less common compared to women, as the prostate examination is not yet widely implemented. Only 1/3 of men aged 40 or older has undergone this kind of test at least once in their lifetime.

PREVENTIVE EXAMINATIONS IN THE PAST 12M BY AGE



PREVENTIVE EXAMINATIONS COVERAGE BY AGE

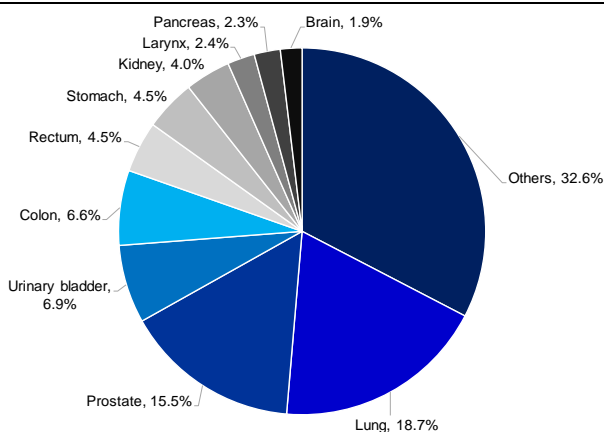


Source: Central Statistical Office, EHIS, Blackpartners

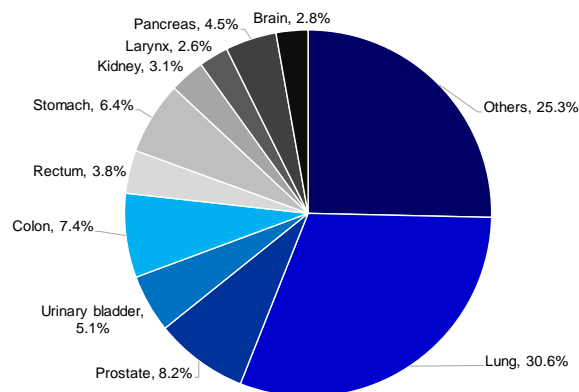
Study conducted by Joanna Didkowska and Urszula Wojciechowska from National Cancer Registry in Poland revealed that in 2013 over 156k new cases of malignant cancer were recorded, over 3,600 cases more than year before. At the same time, more than 94,000 people died due to cancer, slightly less than in 2012. In relative terms, this translates to over 400 new cases of cancer per 100,000 inhabitants and around 1500 people per each 100,000 live with cancer diagnosed within the previous 10 years.

Cancer continues to be one of the leading death causes in Poland, giving way only to cardiovascular diseases (in 2013, 26% of men and 23% of women died due to cancer). Smoking is still a major threat factor, with lung cancer being responsible for over 30% of all cancer related deaths among men. However, some favourable trends, as mentioned in previous sections, lead to a decline in lung cancer incidence. In the case of women, higher share of active smokers among older women along with widespread mammography programme resulted in lung cancer claiming a larger death toll than breast cancer.

CANCER INCIDENCE, MALES



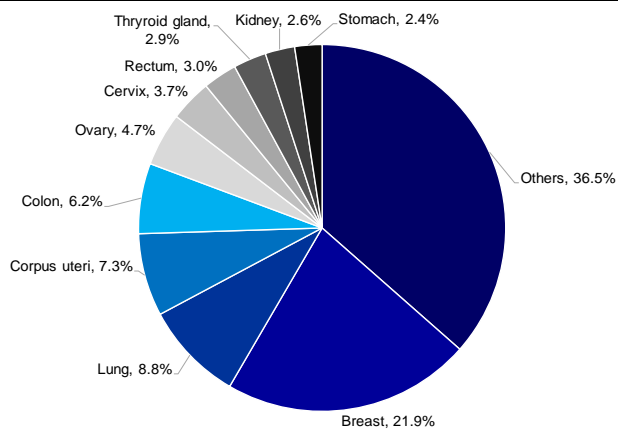
CANCER DEATHS, MALES



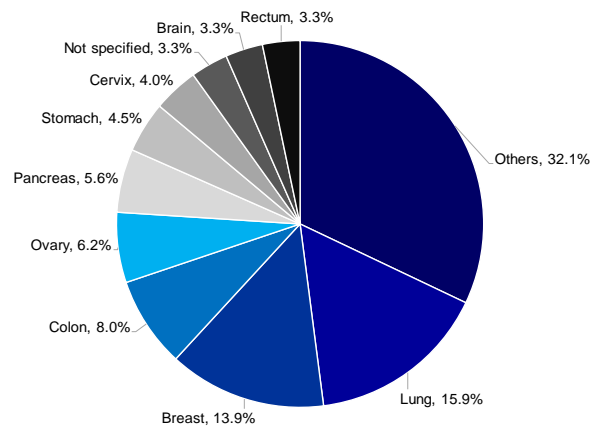
Source: National Cancer Registry, Blackpartners

Prostate cancer exhibits the highest dynamics, especially in the last decade, being the second most frequently diagnosed type of cancer among older males. As far as women are concerned, the three most frequently diagnosed types of cancer relate to lungs, breast and colon. What is worth mentioning, is the increasing incidence of breast cancer accompanied by a decrease in mortality rates. Surely, common mammography programme contributes towards early diagnosis, which remarkably raises the survival probability.

CANCER INCIDENCE, FEMALES



CANCER DEATHS, FEMALES



Source: National Cancer Registry, Blackpartners

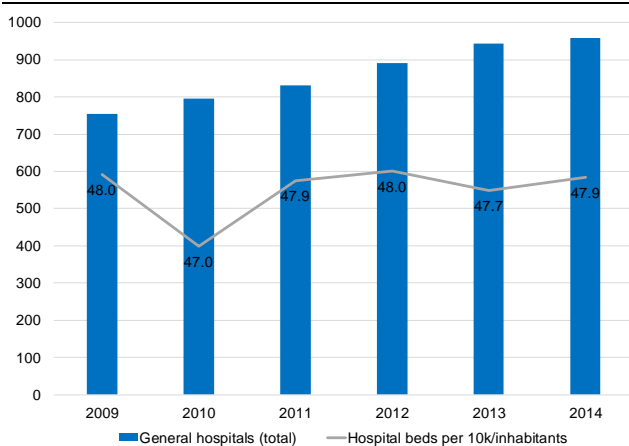
Healthcare provision

Material resources

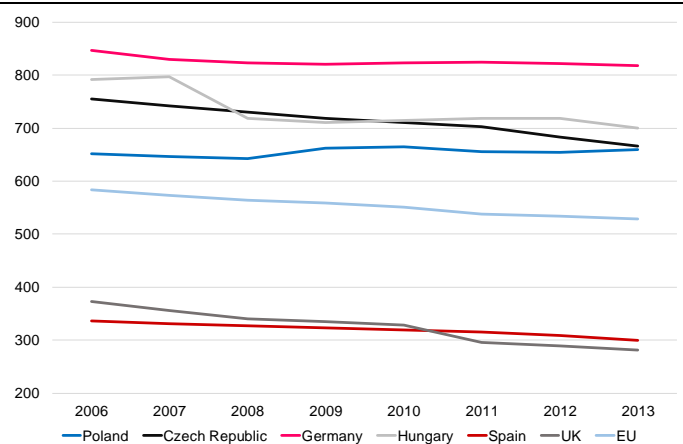
In Poland, at the end of 2014, the Central Statistical Office recorded a total of 979 general hospitals offering almost 190k beds and treating nearly 7.9 million patients. The rate of beds in general hospitals to 100,000 inhabitants was 489 and decreased slightly by 0.1% compared to the previous year. Total number of medical beds, including not only general hospitals, but also psychiatric hospitals and ambulatory care centres amounted to 658/100,000 inhabitants, significantly above the EU average (526). The decline of epidemic diseases along with rising efficiency, results in a systematically diminishing number of beds in Western Europe. Poland, however, shows in this area some backwardness, with the number of beds relatively stable. According to our estimates, the surplus of hospital beds (assuming a desired 80% bed-day occupancy ratio, up from current 67%) stands at 19%.

The ownership structure has undergone some major changes in recent years, as the number of private hospitals grew from less than 300 in 2010 to around 560 in 2015. However, given the new legislation prohibiting private entities to acquire majority stakes at public hospitals and the already expressed disapproval for the commercialization process by the Law and Justice party and we believe that the transformation of public hospitals to private entities will decelerate or even stop in the next years. Moreover, we see a big threat for already existing private hospitals. According to PMR, the majority of private hospitals has signed contracts with the NFZ for a total value of PLN 6.3bn. Favourable treatment of public entities indicated by the new authorities poses a big risk that these contracts will not be renewed in the future.

GENERAL HOSPITALS AND BEDS

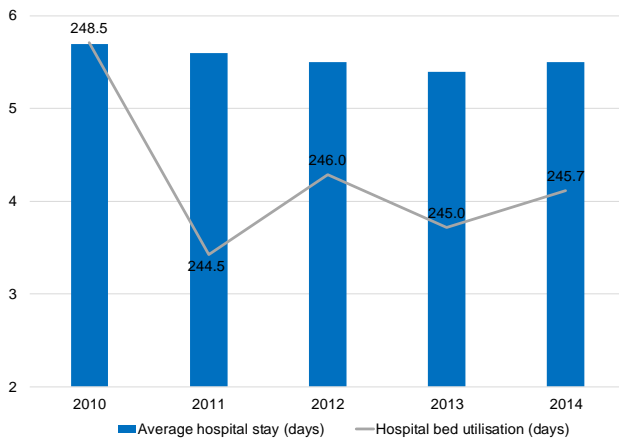


MEDICAL BEDS PER 100,000 INHABITANTS

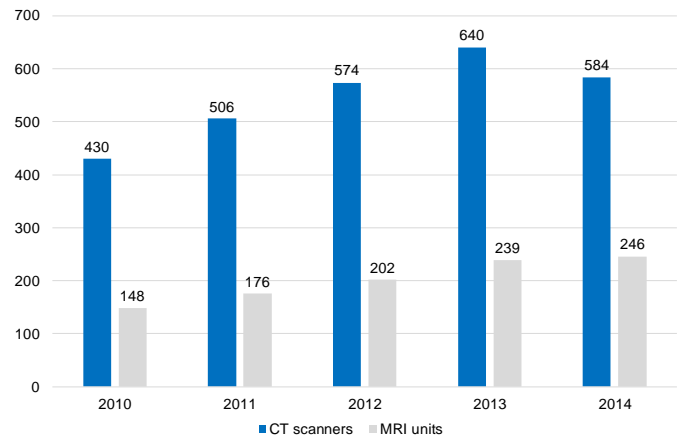


Source: Central Statistical Office, OECD, Ministry of Health, Blackpartners

HOSPITALISATION LENGTH AND BED UTILISATION



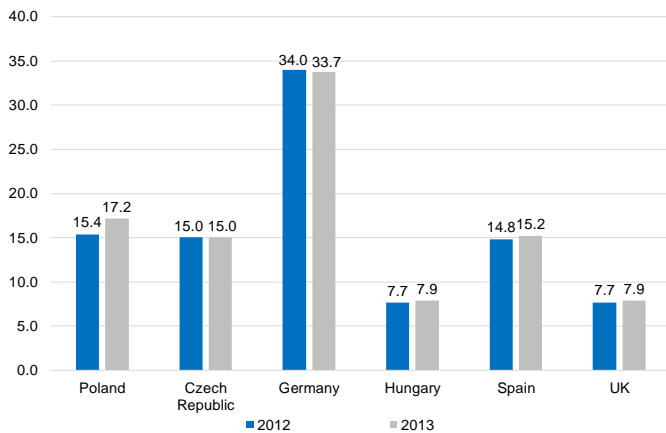
MEDICAL IMAGING DEVICES



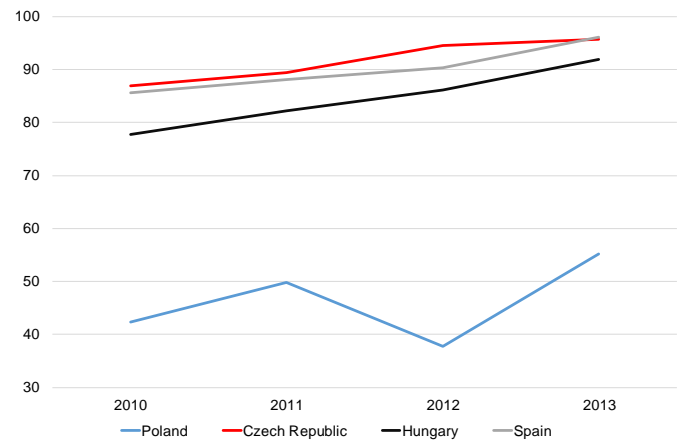
Source: Central Statistical Office, Ministry of Health, Blackpartners

Availability of medical equipment in Polish hospitals varies depending on the type of devices. For example, in 2014, the availability of CT scanners (computed tomography) and lithotripters per 1 million inhabitants was relatively good, while the availability of MRI units (magnetic resonance imaging), gamma cameras and PET scanners was weak.

CT SCANNERS PER 1M INHABITANTS



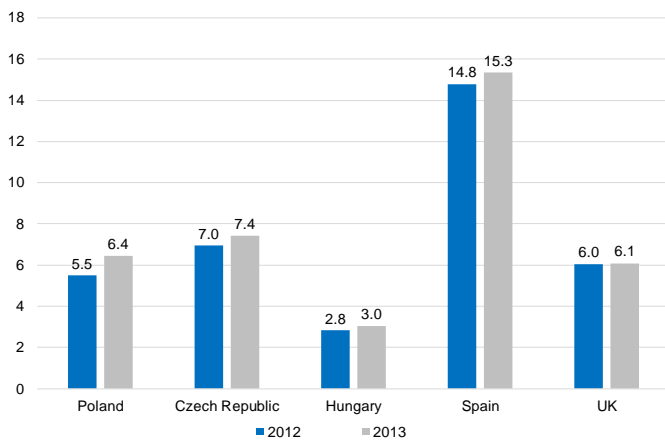
CT EXAMS PER 1000 INHABITANTS



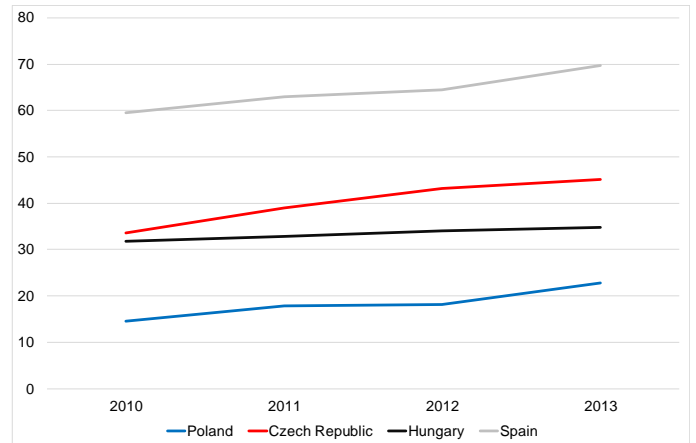
Source: Central Statistical Office, Ministry of Health, OECD, Blackpartners

Our attention is drawn to the low levels of equipment utilization. The number of performed scans per 1000 inhabitants using MRI machines or CT scanners is significantly lower than in other analysed countries. This is due to both low financial resources allocated to medical imaging and improper use of equipment. The Supreme Audit Office indicates that hospital equipment is often outdated, not properly maintained and new equipment is often not used due to lack of space or qualified personnel.

MRI UNITS PER MILLION INHABITANTS



MRI EXAMS PER 1000 INHABITANTS



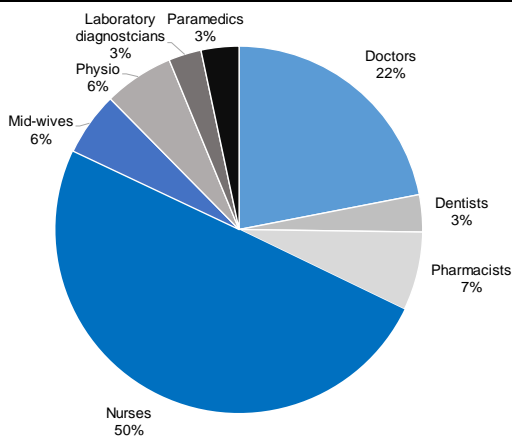
Source: OECD, Blackpartners

Health professionals

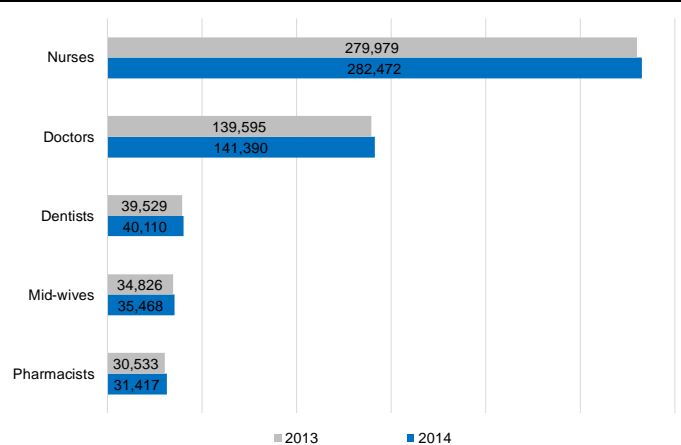
Healthcare practitioners are essential cogs in the entire healthcare system. In 2014, according to records kept by various chambers, the right to practice the profession had 141.5k doctors, 40.1k dentists, 282.5k nurses, 35.5k midwives and 31.4k pharmacists. Compared to the previous year, all of these medical professions experienced an increase in the number of persons entitled to practise medicine. Yet, the saturation of health professionals in Poland is alarmingly low and is likely to worsen.

According to OECD data in Poland falls statistically only 2.24 physician per 1,000 inhabitants. This is one of the weakest results among the EU countries. In neighbouring Czech Republic this indicator stands at 3.7, in Germany at 4.1, while the OECD average is 3.3. Lack of adequate number of doctors in relation to the increasing demand (Poles are the fastest ageing population in the EU) will lead to more and more difficult access to medical services.

EMPLOYMENT STRUCTURE IN HEALTHCARE PROVISION ENTITIES

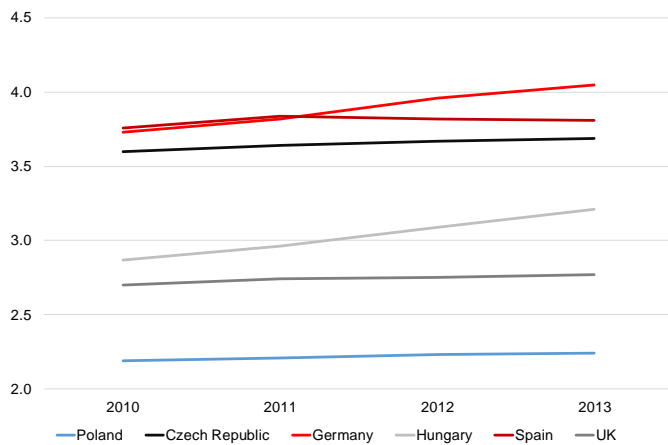


LICENSED PROFESSIONALS

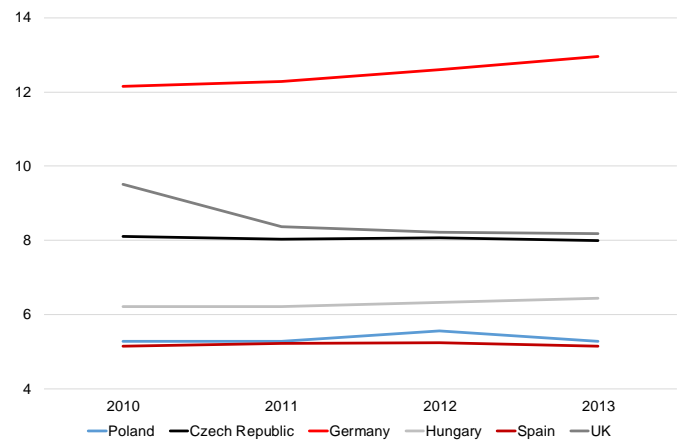


Source: The Polish Chamber of Physicians and Dentists, Ministry of Health, Blackpartners

PRACTISING DOCTORS PER 1000 INHABITANTS



PRACTISING NURSES PER 1000 INHABITANTS



Source: Central Statistical Office, OECD, Blackpartners

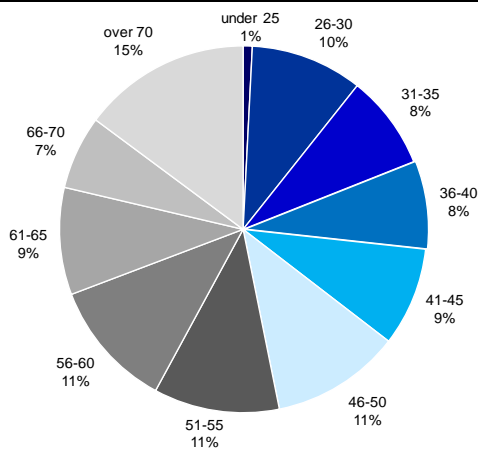
The shortage of human resources in Polish healthcare sector is a result, on the one hand, of the natural losses associated with retiring older generations and migration of healthcare professionals to Western Europe. On the other hand, the influx of new personnel in Poland is mostly driven by domestic supply of new graduates, as recognition of medical degrees earned outside OECD countries in significantly impeded.

The age structure of Polish medical staff is highly disturbing, as 53% of professionally active doctors exceeded 50 years of age, and almost 15% are over 70 years old. With the annual inflow of new specialists relatively constant, the average age of a doctor with specialization is gradually rising and reached 54.5 years in 2016, according to the Polish Chamber of Physicians and Dentists.

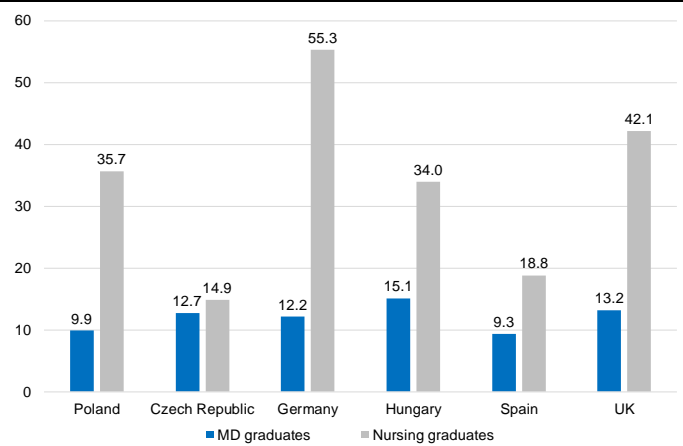
The scale of emigration is not easily quantified. However, the number of issued certificates concerning ethical attitude, which are necessary to work as a doctor in another EU country, may serve as a proxy. Since Poland's accession to the EU, over 10,000 certificates have been issued. In its survey, the Polish Chamber of Physicians and Dentists reports, that today 37% of young doctors is considering moving abroad, which is a big threat to the stability of medical staff in Poland. As the reason for such a decision they declare bureaucracy at work, difficulty in obtaining specialization and lastly – financial matters.

As we mentioned above, the supply of new personnel is almost entirely depended on domestic medical graduates. In the academic year 2015-2016 there were almost 22,000 students pursuing a degree in medicine, which translates to less than 10 MD graduates per 100,000 inhabitants annually. For comparison, Germany has almost 88,000 students pursuing a degree in medicine, and relative to population Poland should have approximately twice more students to reach German level.

LICENSED DOCTORS BY AGE



MEDICAL GRADUATES PER 100,000 INHABITANTS



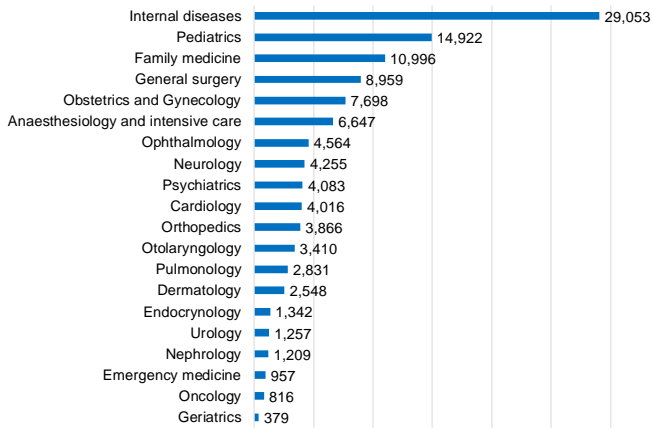
Source: OECD, The Polish Chamber of Physicians and Dentists, Blackpartners

Polish authorities have not yet determined a desired number of employees in particular groups of medical professions. Even though, the Ministry of Health have reported its participation in “Joint Action on Health Workforce Planning” project, which aims to support the competent authorities in planning the medical personnel demand in the EU, the project is still in the implementation phase and obtained results do not yet allow for a meaningful assessment. One of the ideas of the Ministry of Health to tackle the problem of staff shortage is to increase the number of admissions in medical schools. Indeed, the Supreme Audit Office, which investigated the problem, shows that admissions limits during the 2012-2015 period have been increased by 14.4% on full-time medical courses. However, the problem is not only limited to the number of practising practitioners, but also to the level of education and shortage of qualified academic staff.

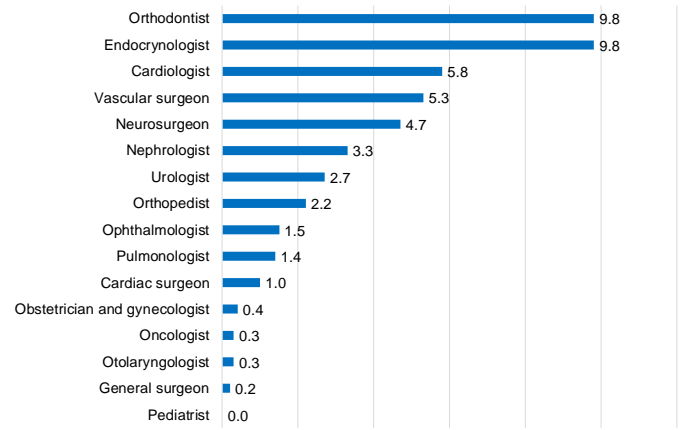
The total number of practising doctors amounted to 132,000 at the end of July 2016. According to the Ministry of Health data for 2014, the number of specialists employed in health care provision entities amounted to over 68,000 or 17.8/100,000 inhabitants in relative terms, up from 16.7/100,000 in 2010. As in previous years, most specialists are doctors with II degree of specialization. Most represented specializations are: internal medicine (2.5/100,000 inhabitants), surgery (2.1), family medicine (1.7) and pediatrics (1.5).

Data analysis shows that the greater number of specialists translates to shorter waiting times. Average waiting period to visit a general surgeon, paediatrician or obstetrician is less than 2 weeks, while queues in endocrinology or orthodontics are more than 9 months, according to Watch Health Care Foundation.

PRACTISING SPECIALISTS IN SELECTED AREAS



AVERAGE WAITING PERIOD FOR SELECTED SPECIALISTS (IN MONTHS)



Source: The Polish Chamber of Physicians and Dentists, Ministry of Health, Barometr Fundacji Watch Health Care nr 13/1/04/2016, Blackpartners

Latest developments & trends

Healthcare reform

At the end of July, the Minister of Health presented the outline of the proposed healthcare reform. The most essential change considers the elimination of the NFZ and the transition from insurance based to budgetary financing system. According to the proposal, all Polish citizens will have access to free health care, and the system will be directly financed from the income tax revenues. Public expenditure on healthcare are supposed to gradually increase starting from 2018, to eventually reach 6% of GDP in 2025 (up from current 4.8%).

Moreover, the proposal includes a new contracting system for hospitals, which involves moving away from financing individual hospitalizations and procedures. Instead, selected hospitals belonging to the so called “hospital network” will receive a lump sum remuneration for the entire year to provide health care services to all patients. Maximum limit contract will be replaced with minimum limit contracts, that hospitals will have to fulfil to receive an adequate budget in the next year. Minister claims that basically all public hospitals will be included in the “network”, while 20% of expenditures will be allocated on the basis of current rules.

We welcome the proposal of transition from insurance based to tax based financing system, which will enable the elimination of the costly mechanism of insurance premium collection. In current conditions, the fraction of population not entitled to health insurance is negligible, so elimination of the insurance scheme will provide significant cost savings and simplify the system. On the flip side, we remain sceptical about the possibility of an increase in public expenditure on healthcare. Polish government, along with Ministry of Finance specialists who work on the new tax system, claim that the new tax will be neutral for the state budget. Having in mind numerous and expensive social programmes, we believe that the government will find difficulty in increasing financing of healthcare. Moreover, according to the schedule the increase will not take effect during current term, so there is a possibility that after next election the whole reform might be reverted.

Furthermore, we believe that the new contracting system will result in decreased efficiency of hospitals and limited competition. The Ministry already communicated that extraordinary procedures will be not financed and we also believe that private hospitals will be discriminated while trying to access the “network”.

Primary healthcare – coordinated care

Coordinated care has proven itself in the United States and many EU countries. Its main goal is the optimization of the process of providing health services, in order to shorten the length of treatment, increase its comprehensiveness and cost-efficiency. Presented healthcare reform also addresses this issue by proposing changes in the primary care provision. The main element of the proposed changes is the creation of a primary care teams consisting of a doctor, nurse, school nurse and a midwife. The Ministry wants these primary care teams to act as treatment coordinators for patients and also to control the course of their treatment in other institutions. In our opinion, the implementation of coordinated care is essential to further optimize Polish healthcare system. However, alike other specialists, we believe that vague financing proposals together with the overburden of already limited number of general practitioners and nurses will simply make the system inefficient and may cause

chaos. Yet, we consider this proposal as a first step in transitioning from fee-for-service to value-based reimbursement system.

Treatment reorganisation

As previously mentioned, Poland has one of the highest rates of medical beds in Europe (more than 600/100,000 inhabitants). Efficiency and cost seeking activities, will result in treatment reorganisation that will see the number of beds to diminish (by 19% according to our estimates), in order to reach around 80% of bed-day occupancy ratio. According to the analysis performed by the Ministry of Health during the 2016-2019 period, as many as 570 beds per year will be liquidated in gynecology & obstetrics, 440 in neonatology wards, 260 in internal disease departments and 94 in pediatric surgery. This forecasted decline is the result of the tendency to shift procedures from hospital wards to ambulatory centres (same-day surgeries), as well as more common use of telemedicine. In Europe this trend is already clearly visible as number of hospitalizations decreases at a double-digit rate.

Group purchasing

Group purchasing organizations (GPO) have become very popular in more developed healthcare industries, especially in the USA. American Healthcare Supply Chain Association estimates that about 72% of all hospital purchases in the USA is being done using GPO contracts, allowing the hospitals to save 10-15% of their purchasing costs. In Poland this form of grouping is still underdeveloped, as hospitals are reluctant to work together mostly due to mutual competition and mistrust towards smaller entities. Moreover, differences in ownership structure (private vs. public) are also an obstacle. Nevertheless, we believe that GPOs will experience rapid growth in the future, similarly as they had in Western Europe, driven mostly by cooperation of private chains. For political reasons, we believe that public providers will group predominantly within regional associations.

Long-term care

Population ageing in Poland and in Europe is a major challenge for the future of pension systems, healthcare, social security and public finances. As we mentioned in previous sections, Poland has one of the fastest ageing populations in Europe, and the share of over 65-year-olds is forecasted to increase by 6 p.p. during the next 10 years, or by 2 million people in absolute terms. This shift will most probably cause a major change in the structure of our economy and create the so called "silver economy".

In healthcare, the ageing of population will result in a significant growth in geriatrics, long-term and rehabilitative care facilities. We expect a major increase in demand for physiotherapists, home nurses and pharmaceuticals marketed to older people.

Telemedicine

Telemedicine continues to be one fastest growing segments in the global healthcare sector. Technavio valued the segment at USD 12bn in 2014 and forecasts it to reach nearly USD 28bn by 2019, growing at a CAGR of 18%. BCC Reserch and Polish Chamber of Commerce forecast similar

growth rates for the global market. Taking into account also necessary technology, the value of telemedicine segment balloons to USD 20bn globally, and is likely to reach around USD 48bn in 2019. This also creates an interesting opportunity for the vendors of monitoring devices, software manufacturers and telecom companies.

As healthcare costs continue to rise, more expensive face-to-face consultations are likely to be replaced by remote diagnostics and treatment management. With remote monitoring enabling patients to access specialized healthcare facilities, recovery periods should shorten, while also saving money and time. Moreover, telemedicine may be a solution to the growing problem regarding the shortage of human resources, by ensuring a more efficient use of geographically dispersed specialists. Lastly, gradual development of telemedicine infrastructure will also, in our opinion, enable a more efficient implementation of coordinated care.

Poland has recently introduced new legislation that enables, under certain conditions, provision of telemedicine services. However, we believe that this segment will grow predominantly within the private sector, as past experiences of the public sector in the implementation of ICT developments makes us sceptical about common, standardized access to telemedicine in the entire healthcare system. We also want to point out the potential of telemedicine in the so called "health tourism". Today, according to PwC, nearly 400,000 health tourists come to Poland annually to receive medical treatment. Telemedicine creates great chance to provide high-quality, yet relatively cheap healthcare services to patients in the entire EU.

Investments and M&A activity

Below we list recent M&A activity in the market and completed or announced investments in healthcare:

- Neuca's acquisition of NZOZ Judyta and Migmed CM. Both transactions are part of Neuca's strategy to invest in primary care and as the result of these transaction Neuca currently manages 48 outpatient clinics in Poland. Transaction values were undisclosed.
- South African private hospital group Life Healthcare is exploring M&A opportunities in Poland. The company has previously acquired a majority stake at Polska Grupa Medyczna.
- EMC Instytut Medyczny expanded its network of specialist clinics by 7 new facilities with the acquisition of three entities (NZOZ Zawidawie, Q-Med and CM Medyk) operating within Aktywne Centrum Zdrowia (ACZ) Group, for a reported value of PLN 25mn. In April EMC Instytut Medyczny also acquired 70.9% stake in "Zdrowie", which operates a regional hospital in Kwidzyn.
- EMC Instytut Medyczny also announced new investment projects worth around PLN 50mn in its facilities in Kwidzyn, Lublin, Katowice and Kowary. The company also communicated further activity on the M&A market.
- Regional Specialist Hospital in Biala Podlaska develops a long-term care and hospice centre. The project is worth in excess of PLN 17mn.
- LuxMed Group plans to officially launch a new oncological hospital in Warsaw in 1Q2017. The facility will have at its disposal over 200 beds. Investment is estimated to be worth north of PLN 100mn.
- Authorities of the Czerwiensk municipality are looking for a private partner to design, build and operate a rehabilitation centre in the PPP formula. The project value has been estimated at PLN 3mn.

- In April, Polski Bank Komorek Macierzystych SA made its debut on the Warsaw Stock Exchange. Selling shareholders sold shares worth PLN 56.4mn. Company did not raise new equity.
- In February, LuxMed announced the purchase of Eurodental, a company specialising in implants, reconstruction, periodontology, orthodontics and diagnostics. The purchase price was not disclosed.
- In January, French long-term care and rehabilitation services provider Orpea Group announced that it has acquired a 90% stake in its Polish peer Medi-System, which operates 7 clinics in Warsaw and Chorzow. Medi-System specialises in neurological and orthopedic rehabilitation and long-term care. The deal value was not revealed.

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