

CATCHING GAPS WITH HEALTHCARE MAPS



A Map of Healthcare Needs for Poland

THE PROJECT IS CO-FINANCED BY THE EUROPEAN UNION FROM THE EUROPEAN SOCIAL FUND UNDER THE OPERATIONAL PROGRAMME KNOWLEDGE EDUCATION DEVELOPMENT

Table of Contents

Introduction.....	4
Demographic and epidemiological aspects	7
2.1 Demographics of Poland and its voivodeships.....	8
2.2 Estimating epidemiological indicators	8
2.2.1 Module A.....	9
2.2.2 Module B.....	11
2.3 Rates for Inpatient Morbidity, Specialist Outpatient Care Morbidity and Consultation for Primary Care	13
2.3.1 Hospital morbidity	13
2.3.2 Prevalence rate in outpatient specialist care.....	14
2.3.3 Consultation rate in primary healthcare.....	15
2.4 Mortality	16
Status and Use of Resources: the Analysis	17
3.1 Hospital care and outpatient specialist care (Module A)	18
3.1.1 Diseases of the musculoskeletal system.....	18
3.1.2 Diseases of the nervous system (neurological diseases in the elderly).....	18
3.1.3 Diseases of the nervous system (other than those in the elderly)	19
3.1.4 Diseases of the aorta and peripheral vessels, including hypertension	24
3.1.5 Diseases of the respiratory system (chronic)	33
3.1.6 Diseases of the respiratory system (acute)	34
3.1.7 Endocrine diseases	35
3.1.8 Childhood diseases	35
3.1.9 Mental disorders	36
3.1.10 Pregnancy, childbirth and the puerperium, and neonatal care.....	38
3.1.11 Diabetes mellitus	42
3.1.12 Neoplasms of haematopoietic or lymphoid tissue	43
3.1.13 Diseases of blood and immune system.....	46
3.1.14 Benign neoplasms	48
3.1.15 Congenital disorders.....	49
3.2 Inpatient Healthcare (Module B).....	50
3.2.1 Metabolic diseases	50
3.2.2 Diseases of the eye and adnexa	51
3.2.3 Diseases of the skin	57
3.2.4 Non-neoplastic diseases of male genital organs.....	62
3.2.5 Diseases of the genitourinary system (in females)	63
3.2.6 Diseases of the kidneys and urinary tract	64
3.2.7 Diseases of liver, biliary tract and pancreas (excluding malignant and non-malignant neoplasms)	65
3.2.8 Diseases of the upper gastrointestinal tract (excluding malignant and non-malignant neoplasms)	66

3.2.9 Diseases of the lower gastrointestinal tract (excluding malignant and non-malignant neoplasms)	67
3.2.10 Diseases of the nose, nasal sinuses, ear, pharynx and larynx	68
3.2.11 Infectious diseases: viral hepatitis	68
3.2.12. Infectious diseases: HIV infection	69
3.2.13 Infectious diseases (excluding hepatitis and HIV infection)	69
3.2.14 Diseases of the oral cavity and dentistry	72
3.2.15 Injury, poisoning, symptoms, signs, and certain other consequences of external causes.	72
3.3 Therapeutic Rehabilitation.....	72
3.4 Health Resort Treatment	73
3.5 Palliative and Hospice Care	74
3.6 Long-term Care	75
3.7 Specialist Outpatient Care.....	76
3.8 Primary Care	82
3.9 Medical Staff.....	85
3.10 Equipment Resources	85
Forecast.....	86
4.1 Population Status and Breakdown Forecast	87
4.2 Forecast of incidence	87
4.3 Projected Number of Beds	88
4.4 Forecasts for selected disease groups.....	88



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Part I

Introduction

Introduction

In accordance with the document approved by the European Commission entitled: "A policy paper on healthcare for years 2014–2020: the national strategic framework", maps of healthcare needs are prepared in two modules (Module A and Module B), each of which comprises 15 disease groups defined on the basis of the International Statistical Classification of Diseases and Related Health Problems, 10th Revision (ICD-10).

Module A covers the following disease groups:

1. Diseases of the musculoskeletal system
2. Diseases of the nervous system (neurological diseases in the elderly)
3. Diseases of the nervous system (other than those in the elderly)
4. Diseases of the aorta and peripheral vessels, including hypertension
5. Diseases of the respiratory system (chronic)
6. Diseases of the respiratory system (acute)
7. Endocrine diseases
8. Childhood diseases
9. Mental disorders
10. Pregnancy, childbirth and the puerperium, and neonatal care
11. Diabetes mellitus
12. Neoplasms of haematopoietic or lymphoid tissue,
13. Diseases of the blood and the immune system
14. Benign neoplasms
15. Congenital disorders

Module B covers the following disease groups:

1. Metabolic diseases
2. Diseases of the eye and adnexa
3. Diseases of the skin
4. Diseases of male genital organs (non-neoplastic)
5. Diseases of the genitourinary system (in females)
6. Diseases of the kidneys and urinary tract
7. Diseases of liver, biliary tract and pancreas (excluding malignant and non-malignant neoplasms)

8. Diseases of the upper gastrointestinal tract (excluding malignant and non-malignant neoplasms)
9. Diseases of the lower gastrointestinal tract (excluding malignant and non-malignant neoplasms)
10. Diseases of the nose, nasal sinuses, ear, pharynx and larynx
11. Infectious diseases: viral hepatitis
12. Infectious diseases: HIV infection
13. Infectious diseases (excluding hepatitis and HIV infection)
14. Diseases of the oral cavity and dentistry
15. Injury, poisoning, symptoms, signs, and certain other consequences of external causes.

The mapping of healthcare needs by disease group consisted of two stages.

The first stage involved the publication (in December 2016) of two sets of maps: a set of maps of healthcare needs dedicated to Module A diseases in hospital care, outpatient specialist care and primary care, and a set of maps of healthcare needs dedicated to Module B diseases whose scope was limited to hospital care only, as agreed with the European Commission.

In the second stage, maps of healthcare needs for Module B diseases in outpatient specialist care and primary care were published (December 2017).

The word *group* as used in this document refers to one of the 30 disease groups defined above, e.g. *Diseases of the nervous system (other than those in the elderly)* analysed in a particular chapter, while the word *subgroup* refers to a subgroup of diagnoses analysed within a specific disease group (e.g. *Demyelinating diseases* is a subgroup of the group *Diseases of the nervous system (other than those in the elderly)*). Unless expressly stated otherwise, all the percentages in this document refer to a particular disease group. For example, in the sentence *The proportion of patients hospitalised nationwide for demyelinating diseases is noteworthy (15.6 thousand hospitalisations, which accounts for 4.9% of all the hospitalisations in the analysed group of diagnoses)*, the 15.6 thousand hospitalisations with the principal diagnosis from the subgroup *Demyelinating diseases* accounted for 4.9% of all the hospitalisations within the group *Diseases of the nervous system (other than those in the elderly)*.



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Part II

Demographic and epidemiological aspects.

2.1 Demographics of Poland and its voivodeships

The demographic status in the analysed period was discussed in the hospital maps of healthcare needs published on 30 April 2016. Due to the size of this document, content already published before will not be repeated here. For more details, see the respective elements of hospital maps.

2.2 Estimating epidemiological indicators

Modelling of the number of new cases is an important activity in evaluating healthcare systems. It allows to define the current epidemiological situation, examine various interrelationships and phenomena, and to identify the determinants of population health. The insufficient number of epidemiological studies in Poland necessitated certain approximations and estimation of the epidemiological indicators (namely, reported incidence rates and reported prevalence rates) based on the data from the National Health Fund.

For the purposes of estimating recorded incidence rates and reported prevalence rates, the subgroups analysed within each disease group were divided into acute and chronic. This was done to identify non-transient diseases, for which it is justified to calculate reported incidence rates and reported prevalence rates, and transient diseases, for which the epidemiological data are approximated by the hospitalised prevalence rate described in another chapter.

For the purposes of analysing the number of new cases for a particular chronic disease, we estimated the reported incidence rate, defined as the number of new patients with this diagnosis who appeared in the public healthcare system. For chronic diseases, the reported incidence was calculated for 2014 based on the NFZ data for the period from 2009 to 2015 (it was possible to analyse the patient's history up to five years back and one year ahead in cases where the rules defined by the experts applied to more than one appearance of the patient in the system). A patient that appeared in the NFZ reporting system during this period was considered a new patient (a first-time patient) if 2014 was the year in which he or she appeared in the system with a given diagnosis for the first time.

The reported prevalence was estimated as of 31 December 2014. Individuals affected by the particular disease on that day were defined as patients who had been classified as new cases in the public healthcare system at any point since 2009 and were still alive on 31 December 2014.

2.2.1 Module A

Table 2.1: Reported incidence and prevalence rates per 100,000 population in 2014 in Poland in chronic subgroups of disease groups.

Disease group	Reported incidence rate per 100,000 population	Reported prevalence rate per 100,000 inhabitants
Diseases of the musculoskeletal system		
Arthropathies associated with infections	13.7	102.1
Inflammatory polyarticular arthropathies	284.7	2,030.1
Systemic connective tissue disorders	154.5	1,357.7
Muscular diseases	21.0	159.3
Diseases of fasciae, tendons and soft tissues (inflammatory)	219.0	1,696.8
Joint diseases	1,538.0	12,299.8
Diseases of fasciae, tendons and soft tissues (non-inflammatory)	1,206.6	8,217.3
Disorders of bone mineralisation and structure	190.1	1,564.2
Other diseases of bone and cartilage	110.7	776.2
Other musculoskeletal and connective tissue diseases	125.8	877.0
Diseases of the spine	1,594.6	12,814.5
Diseases of the nervous system (neurological diseases in the elderly)		
Alzheimer's disease and other dementias	125.8	754.4
Parkinson's disease and other movement disorders	100.0	676.6
Diseases of the nervous system (other than those in the elderly)		
Neuromuscular diseases	97.4	590.8
Demyelinating diseases	15.6	184.2
Cerebral palsy, early developmental disorders and encephalopathies	274.0	1,763.1
Epilepsy	127.2	1,336.6
Degenerative diseases of the spine	1,216.0	9,219.6
Mononeuropathies, nerve compression syndromes and radiculopathies	1,178.1	8,820.5
Diseases of the aorta and peripheral vessels, including hypertension		
Hypertension	928.4	7,284.3
Resistant hypertension	365.2	2,941.4
Atherosclerosis	310.3	2,035.1
Atherosclerosis of renal artery	2.1	12.8
Aortic aneurysm and dissection (excluding abdominal aortic aneurysm)	13.2	67.6
Aneurysm of abdominal aorta and iliac artery	22.4	119.6
Aneurysm of other arteries	15.4	99.4
Pulmonary thrombosis and/or embolism	233.4	1,664.8
Vasculitis	58.3	400.0
Arterial embolism and thrombosis	18.6	92.3
Varicose veins of lower extremities	517.2	3,995.6
Ulcers	97.6	633.8
Lymphoedema	29.9	163.2
Occlusion and stenosis of precerebral arteries	79.3	593.3
Diseases of the respiratory system (chronic)		
Asthma	548.8	4,878.3
Chronic obstructive pulmonary disease	233.6	1,920.2

	Disease group	Reported incidence rate per 100,000 population	Reported prevalence rate per 100,000 inhabitants
	Interstitial lung disease	51.1	357.0
	Sleep-disordered breathing	53.1	320.3
	Chronic inflammatory lung diseases	190.9	1,610.5
	Respiratory failure	56.6	161.2
	Other respiratory diseases	247.2	1,224.5
Endocrine diseases			
	Disorders of reproductive glands	111.9	830.4
	Disorders of adrenal glands	17.6	119.4
	Disorders of pituitary gland	43.5	291.3
	Disorders of parathyroid gland	22.8	125.3
	Disorders of thyroid gland	459.7	4,240.0
	Diseases of pancreas	45.4	235.8
	Diseases with unspecified endocrine diagnosis	123.4	698.3
	Obesity	89.2	634.6
	Benign endocrine neoplasms	401.2	3,840.1
Mental disorders			
	Organic disorders	238.7	1,829.5
	Addictions	296.2	2,456.4
	Schizophrenia	44.4	735.2
	Psychoses other than schizophrenia	26.8	255.6
	Mood disorders	262.0	2,369.5
	Anxiety disorders	605.1	4,995.0
	Eating disorders	10.0	73.7
	Behavioural syndromes associated with physiological disturbances and physical factors	23.1	159.9
	Disorders of adult personality and behaviour	59.8	445.5
	Gender identity disorders and disorders of sexual preferences	1.6	11.8
	Mental retardation	41.6	498.0
	Disorders of psychological development	144.2	1,130.9
	Behavioural and emotional disorders with onset usually occurring in childhood and adolescence	126.6	973.6
	Mental disorder, not otherwise specified	43.2	321.4
Diabetes mellitus	Diabetes mellitus	378.2	3,769.1
Neoplasms of haematopoietic or lymphoid tissue			
	Acute neoplasms of haematopoietic tissue	5.7	31.4
	Chronic neoplasms of haematopoietic tissue	29.4	182.8
	Precursor B- and T-cell neoplasms	0.8	5.6
	Mature B-cell neoplasms	26.7	160.3
	Mature T- and NK-cell neoplasms	1.8	10.7
	Hodgkin lymphoma	3.4	37.9
	Histiocytic and dendritic cell neoplasms	0.7	5.7
	Transplantations	0.6	3.2
Diseases of blood and immune system			
	Deficiency anaemias	52.9	375.4
	Haemolytic anaemias (hereditary)	2.0	16.5
	Haemolytic anaemias (acquired)	2.2	16.2
	Aplastic anaemias	1.6	12.5
	Other anaemias	32.9	156.8

Disease group	Reported incidence rate per 100,000 population	Reported prevalence rate per 100,000 inhabitants
Coagulation defects and other haemorrhagic conditions (hereditary)	2.1	19.0
Coagulation defects and other haemorrhagic conditions (acquired)	48.5	308.9
Other diseases of blood	71.0	471.2
Disorders of immune system (primary)	14.5	99.6
Disorders of immune system (secondary)	9.4	69.7
Disorders of immune system (unspecified)	9.4	59.8
Porphyria	0.3	2.6

Source: Compiled by DAiS based on data provided by the NFZ.

2.2.2 Module B

Table 2.2: Reported incidence and prevalence rates per 100,000 population in 2014 in Poland in chronic subgroups of disease groups.

Disease group	Reported incidence rate per 100,000 population	Reported prevalence rate per 100,000 inhabitants
Metabolic diseases		
Malnutrition	19.6	52.2
Other nutritional deficiencies	20.4	67.2
Obesity	88.8	547.9
Metabolic disorders	178.1	977.4
Osteoporosis and other metabolic disorders of bone	206.6	1,502.4
Vitamin D deficiency	14.7	31.0
Diseases of the eye and adnexa		
Post-cataract conditions	165.5	591.0
Disorders of retina and vitreous body excluding AMD	679.7	5,445.5
Strabismus and amblyopia	2,463.6	21,493.4
Glaucoma	380.2	3,085.2
AMD	175.9	789.1
Disorders of cornea	197.6	1,330.8
Cataracts	667.9	4,892.8
Disorders of eyelid, lacrimal system and orbit	1,383.9	10,167.6
Other	752.9	4,147.7
Diseases of the skin		
Dermatitis and eczema	1,432.9	11,158.4
Autoimmune bullous disorders	10.8	58.5
Cutaneous T-cell lymphoma	1.1	4.7
Selected infections	1,615.6	10,994.4
Non-melanoma skin cancers, conditions, <i>in situ</i> carcinomas	102.3	546.8
Connective tissue disorders and selected systemic inflammatory diseases of the skin	92.0	538.8
Other disorders of skin, hair and nails	902.1	6,404.9
Infections with a predominantly sexual mode of transmission	1,307.8	8,473.4
	13.7	79.4

Disease group	Reported incidence rate per 100,000 population	Reported prevalence rate per 100,000 inhabitants
Psoriasis	167.6	1,409.1
Selected non-malignant neoplasms	933.5	4,923.9
Burns, frostbite, decubitus ulcers, ulcers	253.9	1,435.6
Urticaria and angioedema	200.9	1,252.7
Congenital malformations of skin	15.9	89.6
Non-neoplastic diseases of male genital organs		
Benign hyperplasia of prostate	417.9	3,521.7
Male infertility	5.6	42.2
Redundant prepuce, phimosis and paraphimosis	136.9	883.7
Diseases of female genitourinary tract		
Non-neoplastic disorders of breast	500.1	4,363.4
Abnormal hyperplasia or location of genital mucous membrane of the reproductive system	501.5	3,921.5
Non-inflammatory, non-neoplastic diseases of sex organs	459.8	3,074.3
Fistulae	3.4	21.5
Disorders of menstruation	1,198.7	12,394.3
Disorders of fertility	73.2	509.9
Pelvic organ prolapse	144.3	961.6
Diseases of kidneys and urinary tract		
Glomerular diseases	36.2	270.7
Disorders of mineral metabolism	8.5	53.7
Other disorders of fluid, electrolyte and acid-base balance	43.0	173.9
Hypertension	884.7	5,998.3
Urinary tract infection	276.6	1,737.8
Urinary incontinence	141.6	814.1
Renal tubulointerstitial diseases	59.1	360.8
Renal failure	182.3	743.7
Urolithiasis	315.0	2,298.4
Other disorders of kidney and ureter	113.0	613.1
Other diseases of lower urinary tract	57.4	362.6
Symptoms and signs involving the urinary system	96.5	477.2
Defects of the urinary system	156.7	803.7
Diseases of liver, biliary tract and pancreas (excluding malignant and non-malignant neoplasms)		
Cirrhosis of liver (excluding alcoholic liver disease)	21.0	100.5
Fatty liver diseases	29.6	130.1
Alcoholic liver disease	77.0	371.7
Complications of liver diseases	1.6	6.4
Hepatic failure	8.1	30.3
Toxic liver disease (excluding alcoholic liver disease)	13.1	70.7
Disorders of gallbladder (with or without cholelithiasis)	266.3	1,470.0
Disorders of biliary tract (with or without calculus)	321.6	1,848.8
Congenital malformations of liver, pancreas and biliary tract	3.0	17.1
Chronic pancreatitis (including complications)	44.3	244.5
Diseases of the upper gastrointestinal tract (excluding neoplasms)		
Gastro-oesophageal reflux disease	325.0	1,786.4
Other diseases of oesophagus (not included in the other subgroups)	24.5	122.4
Peptic ulcer disease	156.6	1,057.9
Other diseases of stomach and duodenum (not included)	782.6	4,760.5

	Disease group	Reported incidence rate per 100,000 population	Reported prevalence rate per 100,000 inhabitants
in the other subgroups)			
Other functional disorders of the upper gastrointestinal tract	1,444.4	8,046.1	
Intestinal malabsorption	196.0	854.2	
Diseases of the lower gastrointestinal tract (excluding neoplasms)			
Diseases requiring urgent surgical operation on the lower gastrointestinal tract	140.3	801.8	
Other diseases requiring surgical operation on the lower gastrointestinal tract	378.6	2,126.1	
Non-neoplastic diseases of anus and rectum	384.1	2,333.9	
Crohn's disease	13.3	90.0	
Ulcerative colitis (UC)	33.2	248.0	
Enteritis and colitis, including infectious and parasitic excluding Crohn's disease and ulcerative colitis)	489.1	2,887.6	
Lower gastrointestinal haemorrhage, including vascular disorders	189.3	878.2	
Functional intestinal disorders	1,085.0	6,043.4	
Diverticular disease of intestine	116.7	543.6	
Other reasons for hospitalisation (follow-up and screening examinations)	35.5	179.8	
Other diseases of intestines	343.1	1,877.1	
Diseases of the nose, nasal sinuses, ear, pharynx and larynx			
Diseases of the ear and mastoid process	1,376.9	10,528.1	
Diseases of oral cavity and pharynx	1,095.7	7,752.3	
Diseases of nose and paranasal sinuses	1,652.4	12,167.3	
Diseases of larynx and trachea	545.6	3,884.8	
Disorders of voice, speech and language	67.7	410.0	
Sleep apnoea	42.0	242.4	
Diseases of the organs of hearing and balance	982.5	6,273.8	
Infectious diseases: viral hepatitis			
Chronic viral hepatitis B	15.1	135.6	
Chronic viral hepatitis C	21.2	190.8	
Other and unspecified forms of chronic viral hepatitis	38.8	371.3	
Infectious diseases (excluding hepatitis and HIV infection)			
Tuberculosis	23.5	163.7	
Lyme disease	70.5	394.3	

Source: Compiled by DAiS based on data provided by the NFZ.

2.3 Rates for Inpatient Morbidity, Specialist Outpatient Care Morbidity and Consultation for Primary Care

2.3.1 Hospital morbidity

The hospital morbidity rate is defined as the number of patients hospitalised for a specific group of diagnoses in a given year per 100,000 population according to the place of residence.

The mean values of this rate for each of the disease groups significantly differed between the voivodeships. Given its design, the rate is not affected by the population of a specific voivodeship or by where the patients are treated (patients hospitalised in other voivodeships are counted at their place of

residence). The factors that differentiate the values for specific voivodeships may therefore include: the age and sex structure (differences in the process of population ageing and in the observed fertility ratio), the accessibility to healthcare services (staff, equipment, funds), and the differences in the individual and external risk factors. Taking the above into consideration, the next step should involve analysing the standardised values of this rate.

It is also noteworthy that the hospital morbidity rate was calculated according to the patient's place of residence, which means that it should not be treated as a measure of regional accessibility to healthcare services, as the hospitalisations might have occurred outside the patient's place of residence. Details of hospital morbidity are provided in field-specific maps.

2.3.2 Prevalence rate in outpatient specialist care

The prevalence rate in outpatient specialist care is the number of patients who received at least one consultation at an outpatient specialist clinic according to their place of residence for a diagnosis within a specific group of diagnoses in a given year per 100,000 population.

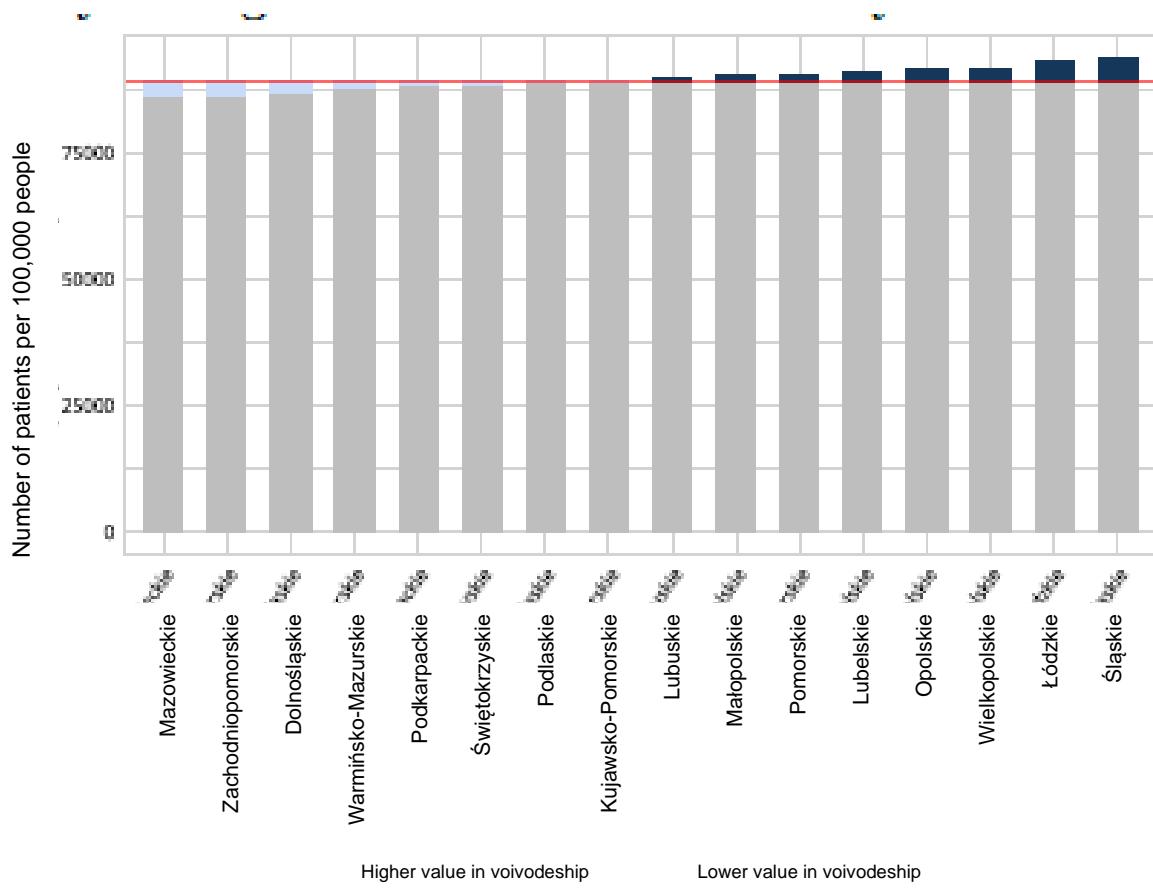
As with the hospital morbidity rate, the mean values of the prevalence rate in outpatient specialist care within individual disease groups significantly differed between the voivodeships. Given its design, the rate is not affected by the population of a specific voivodeship or by where the patients are treated (patients receiving consultations in other voivodeships are counted at their place of residence). The factors that differentiate the values for specific voivodeships may therefore include: the age and sex structure (differences in the process of population ageing and in the observed fertility ratio), the accessibility to healthcare services (staff, equipment, funds), and the differences in the individual and external risk factors. Taking the above into consideration, the next step should involve analysing the standardised values of this rate.

Details of the prevalence rates in the outpatient specialist care are provided in field-specific maps.

2.3.3 Consultation rate in primary healthcare

Consultation rate in primary healthcare represents the number of patients who received primary healthcare services (i.e. those provided by GPs, primary care nurses or primary care midwives) at least once, according to their place of residence, during one year, per 100,000 population. The current reporting procedures make it impossible to carry out an in-depth analysis of the functioning of primary healthcare. In particular, it is impossible to determine the number of patients with chronic conditions (as only 1 reason for the visit is reported) or their treatment pathways (no information on the tests performed is available). In view of the above, no consultation rates for individual disease groups have been determined.

Figure 2.1: Consultation rate in primary care per 100,000 population in individual voivodeships.



Source: Compiled by the Analyses and Strategies Department based on data provided by the NFZ
and the Central Statistical Office.

2.4 Mortality

Basic information on mortality is provided in the hospital maps of healthcare needs published on 30 April 2016. The main causes of death in Poland are heart disease (28% of all deaths) and cancer (24.5% of all deaths). Details of the mortality rate for individual disease groups are provided in other field-specific maps.



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Part III

Status and Use of Resources: the Analysis

3.1 Hospital care and outpatient specialist care (Module A)

3.1.1 Diseases of the musculoskeletal system

Retrospective analysis of the payer's database revealed that of all the diseases of the musculoskeletal system, those of the spine had the highest reported incidence (605.9 thousand cases in 2014). For each of the analysed subgroups, significant differences in the number of hospitalisations per 100,000 population were observed (for both the adult and paediatric populations).

A diverse structure of diagnoses was observed in patients who received rheumatology services. The proportion of patients with inflammatory conditions varied both between the voivodeships and between individual service providers. A considerably high percentage of healthcare providers was observed who reported less than 90% of the minimum annual number of services defined in the *Regulation of the Minister of Health of 20 June 2016 amending the Regulation concerning guaranteed services in hospital care*. What is more, there is a wide variation nationwide in the access to medical rehabilitation after joint replacement surgery. The proportions of patients who received rehabilitation services within 42 days after this procedure were as follows:

- For hip replacement: from 5.4% to 40.1%, with a nationwide average of 20.5%.
- For knee replacement: from 10.8% to 56.5%, with a nationwide average of 37.5%.
- For revision arthroplasty: from 5.4% to 19.6%, with a nationwide average of 12.8%.

These variations are even wider when individual providers are compared. Most services provided to patients with musculoskeletal conditions in outpatient specialist care are reported by three types of clinic: trauma and orthopaedic surgery clinics, rheumatology clinics, and neurology clinics (75% of all the services provided to patients with musculoskeletal conditions).

Based on the ZD-3 reports it was estimated that at least 17.63% of the services provided by trauma and orthopaedic surgery clinics nationwide and 9.19% of those provided by rheumatology clinics had not been funded by the NFZ. Notably, these values vary from voivodeship to voivodeship. A wide variation in the structure of diagnoses was also observed between individual service providers (in extreme cases, the proportion of patients with inflammatory diagnoses at rheumatology clinics was 0%).

3.1.2 Diseases of the nervous system (neurological diseases in the elderly)

The proportion of patients with ischaemic stroke hospitalised in facilities in Poland that do not offer thrombolytic treatment was 19%. Among the facilities that offer thrombolytic treatment, the frequency of using this treatment varied. It should be noted that there are hospitals that admit a considerable number of patients with ischaemic stroke annually (over 100) but do not complete the scope "neurology: hospitalisation A48, A51".

For patients with intracranial (subarachnoid) haemorrhage, the proportion of hospitalisations nationwide during which the “embolisation” procedure was reported was 23.1% and the proportion of hospitalisations during which the “neurosurgery” procedure was reported was 18.2%.

For TIA (transient ischaemic attack), the proportion of patients for whom DRG A47 was reported was 64% and the proportion of patients who developed ischaemic stroke within 365 days of hospitalisation for TIA was about 3%.

In light of the epidemiological data on Alzheimer's disease, the low proportion of patients using public healthcare services is quite striking (an average of 125 cases per 100,000 population in 2014). There are considerable differences between voivodeships in the number of new cases appearing in the public healthcare system, which may suggest underdetection of dementias in certain voivodeships. In only 52% of these hospitalisations a psychologist consultation was reported.

In cases of Parkinson's disease and other movement disorders, the number of hospitalisations per 100,000 population varies from voivodeship to voivodeship. There is also a variation between voivodeships in the access to surgical procedures that are mainly reported under DRG A03 (DBS). A total of about 260 such procedures have been carried out in Poland.

3.1.3 Diseases of the nervous system (other than those in the elderly)

Headache

Headache is a health problem of various aetiologies. Of note are the high number of patients hospitalised nationwide (34.77 thousand hospitalisations, which accounts for 10.8% of all the hospitalisations in the analysed group of diagnoses) and the variation of this parameter between voivodeships (from 7.5% in Pomorskie Voivodeship to 16.6% in Świętokrzyskie voivodeship).

In Poland, MRI scans are obtained during 29.3% of hospitalisations of adults with headache and 31.8% of hospitalisations of children.

Patients over the age of 65 years accounted for only 13.8% of adult patients with headache in Poland. In 91.6% of them, no other conditions defined in the Charlson comorbidity index were observed.

Demyelinating diseases

The proportion of patients hospitalised nationwide for demyelinating diseases is noteworthy (15.60 thousand hospitalisations, which accounts for 4.9% of all the hospitalisations in the analysed group of diagnoses) and the variation of this parameter between voivodeships (from 2.0% in Zachodniopomorskie voivodeship to 7.1% in Kujawsko-Pomorskie voivodeship). Concentration of services within individual voivodeships is also noteworthy, with each voivodeship having only a few dominant facilities managing demyelinating diseases.

Considerable migrations between voivodeships are observed (up to 18.7% of hospitalisations in Kujawsko-Pomorskie voivodeship were for patients from outside this voivodeship), which manifests in high hospitalisation rates in these voivodeships per 100,000 population.

The mean age of hospitalised adult patients was 44 years and there was a female-to-male predominance (68.0%). MRI scans were obtained in 44.9% of hospitalisations of adults with demyelinating diseases.

The access to first- and second-line free drug provision programmes also varied. The ratio of the number of patients in treatment to the population of the individual voivodeship also varied. The treating facilities are unevenly distributed in terms of distance, which can even exceed 100 km in certain locations. Also the accessibility to rehabilitation services varies from voivodeship to voivodeship (from 21.5% in Opolskie voivodeship to 42.9% in Podkarpackie voivodeship).

Neuromuscular diseases

The subgroup of neuromuscular diseases includes polyneuropathies of various origin, diseases of the spinal cord, myasthenia and myopathies. Polyneuropathies were the reason for 50.1% of hospitalisations in this subgroup. A total of 11.87 thousand hospitalisations were reported for neuromuscular diseases, which accounts for 3.7% of all the hospitalisations in the analysed group of diagnoses. Of note is the variation of this percentage between voivodeships (from 1.5% in Lubuskie voivodeship to 4.7% in Małopolskie voivodeship).

Considerable migrations between voivodeships were observed (up to 25.9% of hospitalisations in Mazowieckie voivodeship were for patients from outside this voivodeship), which manifests in high hospitalisation rates in these voivodeships per 100,000 population. The concentration of services within individual voivodeships is also noteworthy.

There is a wide variation in (age-, sex-, and Charlson comorbidity index-) standardised mortality rates between voivodeships for the period of 365 days after hospitalisation (from 7.2% in Podkarpackie voivodeship to 15.8% in Warmińsko-Mazurskie voivodeship). High mortality does not necessarily reflect the quality of hospital care. It may depend on the stage of the disease or on the access to long-term care locally. The next step of the analysis of mortality should involve an analysis according to the patient's place of residence. It is also noteworthy that 578 (5.3%) adult patients in Poland are readmitted to any hospital with a diagnosis from the analysed disease group within 30 days, which makes it one of the highest readmission rates in the analysed group.

In 2014, immunoglobulin therapy was not yet covered by a free drug provision programme. The proportion of hospitalisations involving immunoglobulin therapy considerably varied (from 4.0% in Małopolskie Voivodeship to 25.8% in Łódzkie Voivodeship). The differences in the proportion of hospitalisations with plasmapheresis may be due to the varied access to plasmapheresis. In two voivodeships (Pomorskie and Lubuskie) no hospitalisation with plasmapheresis was reported. Also the

accessibility to rehabilitation services varies from voivodeship to voivodeship (from 27.1% in Podlaskie voivodeship to 52.4% in Podkarpackie voivodeship).

Degenerative diseases of the spine

Degenerative diseases of the spine were the largest subgroup in terms of hospitalisations in Poland within the analysed disease group. A total of 68.23 thousand hospitalisations were reported nationwide for degenerative diseases of the spine, accounting for 21.3% of all the hospitalisations in the analysed group of diagnoses. Of note are the variation of this percentage between voivodeships (from 16.3% in Dolnośląskie voivodeship to 30.9% in Warmińsko-Mazurskie voivodeship) and the high hospitalisation rates per 100,000 population in the eastern voivodeships. Within this subgroup, hospitalisations are evenly distributed (no significant concentration is observed).

Treatment of degenerative diseases of the spine varies between voivodeships and service providers both in terms of the number of hospitalisations and treatment modality (medical versus surgical). Surgical hospitalisations accounted for 50.1% in Poland. The next step should involve including in the analysis the flow of patients from non-surgical to surgical wards over one year. It is noteworthy that spinal MRI or CT scans were reported for only 32.7% of all the hospitalisations. This low percentage may be due to the fact that the reporting of this procedure under specific DRGs is not required. It seems that some of the non-surgical procedures could be carried out in outpatient specialist care.

The proportion of consultations provided in outpatient specialist care is high. They account for about 10.8% of all the consultations provided by neurology clinics (often several times a year). Degenerative diseases of the spine are the most common reason for patient visits to neurosurgery clinics and account for 51.1% of all consultations.

Given the high epidemiological prevalence of this disease, a method for assessing treatment effectiveness should be developed. As a further step, the impact of treatment on the patient's occupational activity should be analysed, as this could be a measure of treatment effectiveness. Alternatively, the methodology used in the International Spine Registry "Spine Tango" could be followed, as several Polish hospitals are already participating in this project.

Mononeuropathies, nerve compression syndromes and radiculopathies

A total of 55.22 thousand hospitalisations were reported in Poland for mononeuropathies, nerve compression syndromes or radiculopathies, which accounts for 17.2% of all the hospitalisations in the analysed group, although the exact percentages varied from voivodeship to voivodeship (from 11.3% in Kujawsko-Pomorskie Voivodeship to 24.3% in Pomorskie Voivodeship).

The nationwide surgical hospitalisation rate was 72.1%, and a closer look should be taken at the proportion of hospitalisations during which surgical procedures are carried out. In the next step, it would be advisable to determine which disease entities are most commonly managed surgically. It seems that some of the non-surgical procedures (which, for example, accounted for 26.7% in Mazowieckie Province) could be carried out in outpatient specialist care, where the proportion of consultations is high and which account for about 22.6% of all the consultations provided by neurology clinics, often several times a year.

No measure of treatment effectiveness is in place. As a further step, the impact of treatment on the patient's occupational activity should be analysed, as this could be a measure of treatment effectiveness with respect to radiculopathies and nerve compression syndromes.

Cerebral palsy, early developmental disorders and encephalopathies

A total of 17.83 thousand hospitalisations were reported in Poland for cerebral palsy, early developmental disorders and encephalopathies (which accounted for 5.6% of all the hospitalisations in the analysed group). The percentage contribution of this subgroup to all the hospitalisations in the analysed group varied from voivodeship to voivodeship (from 3.9% in Świętokrzyskie Voivodeship to 9.2% in Kujawsko-Pomorskie Voivodeship).

In children, concentration of services within individual voivodeships is noteworthy, and their median length of stay was 2 days in Poland, which may suggest that a large proportion of patients is hospitalised for evaluation only and could justify the creation of a comprehensive evaluation package in the form of one-day hospitalisation with coverage of the costs of necessary testing (including neuroimaging, metabolic and genetic testing).

The current reporting system does not include high-cost procedures, such as metabolic or genetic testing, as a result of which the real costs of evaluation and treatment are not taken account of. Medical experts consider it justified to introduce a system for analysing these procedures.

Epilepsy

Epilepsy is a heterogenous disease syndrome characterised by a varied clinical course. A total of 37.65 thousand hospitalisations were reported in Poland for epilepsy (which accounted for 11.7% of all the hospitalisations in the analysed group). The percentage contribution of this subgroup to all the hospitalisations in the analysed group varied from voivodeship to voivodeship (from 6.3% in Podlaskie Voivodeship to 14.7% in Małopolskie Voivodeship), with considerable migrations between voivodeships being observed (up to 22.1% of hospitalisations of patients aged below 18 years in Mazowieckie Voivodeship were for patients from outside this voivodeship), which manifests in high hospitalisation

rates in these voivodeships per 100,000 population. A total of 1.01 thousand children (6.1%) in Poland are readmitted to any hospital with a diagnosis from the analysed disease group within 30 days, which makes it one of the highest readmission rates in the analysed group.

The proportion of transcranial doppler ultrasound scans reported in Poland (9.6%) is noteworthy. What is more, in 15.3% of DRG A67 hospitalisations, video-EEG monitoring was not carried out but an ultrasound scan was.

Data available from the NFZ are insufficient to allow a comprehensive evaluation of care provided to patients with epilepsy in Poland, such as the accessibility of surgical treatment including implantation of vagus nerve stimulation devices. The non-reporting of psychological consultations necessary for the differential diagnosis of epilepsy is noteworthy and is most likely due to the fact that the reporting of these consultations is not required for the reconciliation of specific DRGs. Also, no data are available to analyse the differential diagnosis completed in patients with non-epileptic seizures (e.g. psychogenic non-epileptic seizures). The current reporting system does not include high-cost procedures, such as patient qualification for treatment with the ketogenic diet, and treatment with the ketogenic diet itself, which makes it impossible to analyse their use.

In-hospital mortality rates for status epilepticus are also noteworthy. In adults, they ranged from 2.3% in Dolnośląskie Voivodeship to 21.1% in Lubelskie Voivodeship. Only 2 voivodeships reported in-hospital deaths of children diagnosed with status epilepticus. These findings may suggest a misdiagnosis and the lack of access to diagnostic tests, especially EEG. No measure of treatment effectiveness is in place. As a further step, the impact of treatment on the patient's occupational activity should be analysed, as this could be a measure of treatment effectiveness.

Head injuries

A total of 46.52 thousand hospitalisations were reported in Poland for head injury (which accounted for 14.5% of all the hospitalisations in the analysed group). The percentage contribution of this subgroup to all the hospitalisations in the analysed group varied from voivodeship to voivodeship (from 9.9% in Warmińsko-Mazurskie Voivodeship to 21.1% in Świętokrzyskie Voivodeship).

Of note is the large difference between the average length of stay (7.98 days) and the median length of stay (4 days) in Poland, which may suggest a large bed occupancy by patients with a long duration of hospitalisation. This may suggest a problem with transferring patients to long-term care.

Due to the non-reporting of indicators (e.g. Glasgow coma scale) that would allow to assess the injury type and severity, and therefore to comment on the outcomes of treatment and the further course of patient treatment and rehabilitation (particularly in cases of severe head injuries), it is not possible to unequivocally compare individual facilities.

No measure of treatment effectiveness is in place. As a further step, the impact of treatment on the patient's occupational activity should be analysed, as this, in conjunction with a measure of injury severity, could be a measure of treatment effectiveness.

Spinal injuries

A total of 16.83 thousand hospitalisations were reported in Poland for spinal injury (which accounted for 5.2% of all the hospitalisations in the analysed group). The percentage contribution of this subgroup to all the hospitalisations in the analysed group varied from voivodeship to voivodeship (from 3.8% in Kujawsko-Pomorskie Voivodeship to 6.4% in Śląskie Voivodeship). Also the accessibility to rehabilitation services varied from voivodeship to voivodeship (from 15.0% in Świętokrzyskie Voivodeship to 35.4% in Lubuskie Voivodeship).

Due to the non-reporting of indicators that would allow to assess the injury severity it is difficult comment on the outcomes of treatment and the further course of patient treatment and rehabilitation, particularly in cases of severe spinal injuries.

As a further step, the impact of treatment on the patient's occupational activity should be analysed, as this, in conjunction with a measure of injury severity, could be a measure of treatment effectiveness.

Encephalitis, myelitis and meningitis

A total of 8.14 thousand hospitalisations were reported in Poland for encephalitis, myelitis or meningitis (which accounted for 2.5% of all the hospitalisations in the analysed group). The percentage contribution of this subgroup to all the hospitalisations in the analysed group varied from voivodeship to voivodeship (from 1.0% in Lubelskie Voivodeship to 9.2% in Podlaskie Voivodeship), and the management of these diseases is strongly concentrated in hospitals with infectious disease wards,

Infectious encephalitides predominate in this group of diseases. Cases of autoimmune encephalitis are not reported, as no relevant ICD-10 or ICD-9 codes exist.

A total of 319 (5.6%) adult patients in Poland are readmitted with a diagnosis from the analysed disease group within 30 days, which makes it one of the highest readmission rates in the analysed group. Of note is the wide variation in (age-, sex-, and Charlson comorbidity index-) standardised mortality rates between voivodeships for the period of 365 days after hospitalisation (from 5.0% in Podlaskie Voivodeship to 14.6% in Łódzkie Voivodeship).

3.1.4 Diseases of the aorta and peripheral vessels, including hypertension

Hypertension and resistant hypertension

1. Hypertension is most commonly managed in the outpatient setting, and hospitalisations for this diagnosis account for a relatively low percentage (0.9%) of all hospitalisations. A large percentage of hospitalisations is, however, observed in cases where hypertension is a comorbid diagnosis (78.9 thousand hospitalisations were reported in Poland with hypertension and the principal diagnosis and 771.4 thousand with hypertension as a comorbid diagnosis), as a result of which the actual number of patients managed in hospitals is higher.
2. Admissions for hypertension as the principal diagnosis (excluding resistant hypertension) were mainly emergency admissions. Emergency admissions in Poland accounted for 63%.
3. The duration of hospitalisation for hypertension (excluding resistant hypertension) varied between service providers. Providers with longer lengths of stay and higher readmission rates are noteworthy. The nationwide average length of stay was 4.3 days. The nationwide readmission rate (readmission within 90 days to any hospital with a diagnosis from the analysed group) was 2.82%.
4. The number of hospitalisations for resistant hypertension in Poland was 13.1 thousand. This figure seems to be underestimated, most likely due to the poor quality of data available in the reporting system.
5. In Poland, hospitalisations with the diagnosis of resistant hypertension are characterised by a lower rate of emergency admissions than hospitalisations of the other cases of hypertension (54.51% vs. 63.24%) and a higher rate of readmissions within 90 days (7.38% vs. 2.82%).
6. In Poland, in specialist outpatient care, cardiology clinics were those that provided the largest number of consultations to patients with hypertension.
7. There are few hypertension clinics in Poland (14 in total with no such clinics in the Łódzkie, Opolskie, Pomorskie, Podkarpackie and Świętokrzyskie Voivodeships), which results in long waiting times in these facilities (the median waiting time from referral to consultation in specialist outpatient care in Poland is 269 days).
8. In Poland, 55.18% of consultations in hypertension clinics was provided to patients who visited the facility 3 or more times in 2014.
9. The currently available data refer to patients who appeared in the reporting system, which—given the long waiting times for visits in specialist outpatient care and for hospitalisations, and given the large proportion of emergency admissions—suggests much higher needs for hypertensive patient care.

Diseases of the aorta and peripheral vessels

1. In the case of some of the service providers, large differences in the reported procedures were observed in Poland. Some facilities, even though they have a contract covering “vascular surgery

— hospitalisation”, perform only a few procedures in relevant scopes, which may affect the outcomes of treatment, especially in cases of procedures that require a specific number of surgeries to maintain a specific level of experience in that facility, and the possibility of training in vascular surgery (e.g. procedures on carotid arteries, procedures on the aorta).

2. A small proportion of hospitalisations are provided on angiology wards or as part of the scope “angiology”(in Poland, 1.4% of hospitalisations on angiology wards of all the hospitalisations for the diseases of the aorta and peripheral vessels, 1.6% of hospitalisations reported as part of the scope “angiology” among all the hospitalisations for the diseases of the aorta and peripheral vessels). Further analyses should focus on the accessibility to angiology specialists.
3. Further analysis will need to evaluate consultations resulting in referrals to hospital and consultation as part of which diagnostic tests were performed or the patient was referred for investigations that allowed to establish the final diagnosis or to qualify the patient for or to disqualify them from surgery. This is also associated with the need to evaluate the availability of diagnostic equipment in such clinics and the accessibility of specialist diagnostic tests to the patients in individual regions (voivodeships).
4. In the aspect of further analyses, it is necessary to evaluate accessibility and resources that can be used in comprehensive management of patients with diabetic foot, including the accessibility to surgical and endovascular treatment and multispecialty care for this group of patients.
5. In the context of the ageing population and the increasing number of patients requiring renal replacement therapy and patients with diabetes mellitus and co-existent renal failure, the analysis should also include accessibility and resources in terms of producing access to dialyses in individual voivodeships and regions of Poland. The analysis should also include the needs in this respect based on the assessment of the current epidemiology of renal failure in the Polish population.
6. Access to vascular clinics varies (with none such clinics existing in the Warmińsko-Mazurskie and Podkarpackie Voivodeships in 2014 and with 38 such clinics in the Śląskie Voivodeship). Similar observations were made for vascular surgery clinics, whose number varied from voivodeship to voivodeship (from 1 each in the Lubuskie and Podlaskie Voivodeships to 24 in the Mazowieckie Voivodeship). The median waiting time from referral to consultation at a vascular clinic in Poland was 195 days. For vascular surgery clinics, the mean waiting time in Poland was 205 days.
7. In Poland, in vascular clinics, W11 consultations (the so-called repeat prescriptions appointments) account for a considerable proportion of consultations. The proportion of these consultations in Poland was 39%. It should also be noted that in Poland, in vascular clinics, 36% of all consultations were provided to patients who appeared once during the year, while 33% were provided to patients with 3 or more visits.
8. As in the cases of vascular clinics, W11 consultations (the so-called repeat prescriptions appointments) account for a considerable proportion of consultations in vascular surgery clinics. The proportion of these consultations was 54%. It should also be noted that in Poland, in vascular surgery clinics, 33% of all consultations were provided to patients who appeared once during the year.

Atherosclerosis

1. Based on the currently available reporting system, it is not possible to differentiate between patients admitted with a limb at risk of amputation due to critical ischaemia and patients hospitalised for intermittent claudication. It is also impossible to reliably verify the presence of comorbidities and their severity in the population of hospitalised patients, which significantly interferes with a realistic assessment of quality in individual facilities.
2. Among the hospitalisations for atherosclerosis, emergency admissions predominate (59.67% in Poland).
3. In Poland, hospitalisations with surgical procedures being indicated¹ account for 30.82% of hospitalisations for atherosclerosis.
4. Differences between the providers can be observed in terms of the number of reported procedures, both vascular surgical procedures (including peripheral or abdominal procedures) and endovascular procedures. Particular differences are observed with respect to patients undergoing vascular surgical procedures on abdominal vessels. These observations can be explained by both the continuous development of endovascular methods in vascular facilities and the selection of patients requiring treatment in facilities that offer the possibility of treating the underlying illness and complications in their broad sense.
5. There is a worrying fact in terms of the possibility to ensure access to the full range of services: providers have been identified in the voivodeships that reported fewer than 5 procedures of this type in 2014 (vascular surgery procedures in the abdominal area). From the viewpoint of accessibility to specialist care, it is justified to base the system of healthcare provided to this patient group on facilities that can offer a full range of procedures to the degree that ensures achievement of appropriate experience and quality of the services provided.
6. An increasing number of procedures in vascular facilities are conducted as endovascular procedures: in Poland, the proportion of patients who underwent an endovascular procedure for atherosclerosis was 21.54%.
7. Individual facilities vary in terms of proportions of patients treated with surgery and those treated with endovascular procedures. In some facilities, however, there is a predominance of one or the other type of treatment.
8. Mortality after vascular surgical procedures in the abdominal area varies from voivodeship to voivodeship, with a nationwide mortality rate of 6.23%. The current reporting data make it impossible to determine the characteristics of the treated population (critical ischaemia, intermittent claudication, comorbidities), and the assessment of standardised mortality adopted

¹ ICD-9-CM codes: 38.124, 38.126, 38.146, 38.324, 38.424, 38.426, 39.251, 39.252, 39.253, 39.254, 39.255, 39.256, 39.257, 39.261, 39.262, 39.492, 39.493, 39.496, 38.113, 38.120, 38.123, 38.128, 38.140, 38.143, 38.148, 38.318, 38.320, 38.323, 38.328, 38.418, 38.423, 38.428, 39.231, 39.29, 39.291, 39.292, 39.293, 39.294, 39.295, 39.296, 39.297, 39.298, 39.299, 39.491, 39.494, 39.495, 39.497, 39.56, 39.57, 00.45, 00.46, 00.47, 00.48, 00.634, 00.671, 00.672, 39.427, 39.501, 39.502, 39.503, 39.504, 39.507, 39.521, 39.528, 39.529, 39.751, 39.904, 39.905.

in our analysis requires verification in the form of a prospective clinical observation that would take into account the risk factors for complications and deaths in the patients.

9. A low proportion of hospitalisations was preceded, within 90 days, by a visit to a vascular clinic or a vascular surgery clinic (22.4% in Poland). A further analysis will need to look into where the patients are referred from to vascular surgery facilities as elective and emergency patients and how many of them have had investigations, including imaging studies, done before the hospitalisation.
10. Analysis of treatment outcomes expressed as amputation rates for specific types of procedures requires that the degree of limb ischaemia (critical ischaemia) is taken into account, however, these data are not currently available in the reporting system. These findings point to the necessity to modify the current reporting system for the purposes of further analyses necessary to evaluate the healthcare system in this aspect.

Amputations

1. A large proportion of primary major lower limb amputations for vascular reasons are observed. In Poland, the proportion of primary amputations (i.e. not preceded by a vascular intervention within 4 years before the amputation — according to the definition determined by the availability of data from the reporting system) was 51.6%.
2. Further analysis should focus on: early hospitalisation or consultation at a vascular clinic / vascular surgery clinic, and previous imaging studies, including angio-CT, which facilitate decision-making in regard to revascularisation or disqualification from reconstructive treatment (most of the primary amputations were carried out on general surgery wards). It should also be borne in mind that the analysis of “primary” amputations may be associated with an error resulting from the lack of access to data on patients treated more than 4 years before, which results from the availability of data. The value of this indicator should, however, be regularly monitored.
3. The currently available data on the number of amputations, including amputations after vascular procedures, and the number of “minor” limb amputations may be underestimated. This is due to the method of reporting which results from the system of financial settlements and the reporting of only the most expensive procedure performed at a given facility (excluding other procedures, such as amputations) — all these comments should be taken into account when modifying the reporting system.

Occlusion and stenosis of carotid arteries

1. Differences in the number of procedures (both surgical and endovascular) can be observed in individual facilities. In some facilities, however, there is a predominance of one or the other type of treatment.
2. A significant observation in terms of treatment accessibility but potentially also in terms of treatment quality is the fact that some facilities do not carry out many carotid artery procedures. In Poland, fewer than 10 (but more than 0) surgical²procedures annually are carried out in 14 facilities and more than 0 and fewer than 10 endovascular procedures³ are carried out in 24 facilities. These findings call into question the realistic possibility to maintain treatment quality and ensure that the staff can be trained in this respect.
3. Among the hospitalisations for carotid artery stenosis, elective admissions predominate (63.29% in Poland). The fact that is impossible to verify emergency admissions in 2014 makes it impossible to identify the population of symptomatic patients with carotid and vertebral artery stenosis. The current reporting system does not provide information on the proportion of symptomatic patients among patients hospitalised for this condition, and *[text cut off]*
4. In Poland, 7.16% of hospitalisations in this group of patients ended in a readmission to a neurology ward within 365 days.
5. No reliable data are available on the actual frequency of neurological complications, as only readmissions for stroke are recorded. On a vascular ward, for instance, stroke is not reported if the patient is subsequently transferred to a neurology ward.

Aneurysm of abdominal aorta and iliac arteries (unruptured)

1. Differences between the providers can be observed in terms of the number of reported surgical and endovascular procedures for abdominal aorta and iliac artery aneurysms. Endovascular treatment of abdominal aorta and iliac artery aneurysms prevails in Poland over surgical treatment, with 36.27% of the procedures being endovascular procedures and 20.91% being based on surgical procedures.
2. Of note is the wide variation in the proportion of patients receiving endovascular treatment in individual facilities within specific voivodeships. At the same time, some facilities reported a small number of procedures that were traditional surgical procedures for the treatment of abdominal aortic aneurysm.
3. Even though surgical procedures for abdominal aortic aneurysm are carried out in both primary and secondary referral facilities, a considerable nationwide predominance of facilities classified as secondary referral facilities for vascular surgery is seen, both in terms of the total number of patients hospitalised and provided with surgical treatment for this condition and the number of traditional surgical procedures reported (coupled with a high proportion of patients receiving endovascular treatment also in these facilities).
4. An in-depth analysis is also needed with respect to the variation in 30-day mortality among patients receiving surgical treatment for abdominal aortic aneurysm. The currently reported data

²ICD-9-CM: 38.112, 38.122, 38.132, 38.142, 38.192, 38.312, 38.313.

³ICD9-CM: 00.631, 00.633, 00.634

are insufficient to allow us to evaluate the indications for surgical treatment (e.g. symptomatic patient, ineligibility for stent-graft placement in a patient with adverse anatomy) or to verify the actual severity of comorbidities, which makes it difficult to unequivocally establish whether the differences in mortality result from the quality of care or the unique characteristics of this group of patients.

5. Further analysis should assess the detection and monitoring of patients with abdominal aortic aneurysm. It would be important to determine the number of patients referred to hospital without prior care being provided by vascular clinics or vascular surgery clinics, namely the patients diagnosed with abdominal aortic aneurysm or iliac artery aneurysm whose sizes required emergency hospitalisation (no possibility to analyse emergency admissions in 2014). Given the large number of patients receiving specialist consultation for this diagnosis at vascular clinics and hospitalised in Poland, it would also be justified to determine the principles of screening to early detect abdominal aortic aneurysm in the elderly population (especially, in line with the literature reports, in the population of male smokers over the age of 60 years).

Ruptured aneurysm of abdominal aorta and/or iliac artery

1. A total of 870 hospitalisations were reported for ruptured aneurysm of the abdominal aorta and/or iliac artery, including 638 hospitalisations for which surgical or endovascular procedures were reported (513 and 125 hospitalisations, respectively).
2. There is a wide variation between the facilities in terms of the number of patients hospitalised for ruptured aneurysm of the abdominal aorta or iliac artery.
3. In 2014 in Poland 36 facilities were operating that reported at least 1 and fewer than 5 surgeries of a ruptured aneurysm of abdominal aorta or iliac artery, and 25 facilities reporting 1 or 2 procedures in a year.
4. Due to the small number of surgery patients in the facilities reporting only a few surgeries from this scope, it is not possible to evaluate the treatment quality in this scope in all vascular wards. This analysis is only possible in high volume centres, which are dedicated to treating this patient group, and to which patients from a given region are referred. In-hospital mortality of patients with a ruptured aneurysm of abdominal aorta or iliac artery who were treated surgically was 57.9% in Poland; in the case of endovascular procedures, it was 32.54%.
5. Further analysis should include evaluating the rescue system for this patient group, taking into account the geographical factor: distance from specialised facilities, referring patients to referral facilities with the highest standard of care, including multispecialty postoperative care for this patient group. On the voivodeship level, defining the rules of referring patients, and selecting facilities dedicated to this patients group, is justified. At the same time, the analysis should include a patient's place of residence and the time of their commute to the facility.

Aortic aneurysm and dissection (excluding abdominal aortic aneurysm)

1. The proportion of emergency admissions of patients with this diagnosis in Poland was 52% and only 8% of all admissions with this diagnosis was preceded within 90 days with a visit in specialist outpatient care. Based on the currently available reporting system, it is not possible to evaluate the outcomes of endovascular treatment with reference to the type of disorder being diagnosed (dissection, aneurysm of descending aorta, aneurysm with chronic dissection), its extent (segmental aortic dissection or dissection of the whole descending aorta) and its duration (acute, subacute, chronic dissection). Detailing diagnoses and patient groups is, in this aspect, justified. Evaluating the number of patients whose (scheduled and emergency) hospitalisation was preceded by diagnostic imaging of the suspected disorder (an analysis of access to diagnostic tests) is justified in further analysis.

Arterial embolism and thrombosis

1. In 2014, the number of hospitalisations due to arterial embolism and thrombosis in Poland was 6.03 thousand. Providing appropriate accessibility to this type of treatment is necessary in the whole country, and in the whole voivodeship. Analysing the variation between voivodeships in the number of hospitalisations with this diagnosis, per 100,000 population, is justified.
2. The majority of hospitalisations of patients with the diagnosis of arterial embolism and thrombosis are emergency admissions (91% in Poland).
3. Treating patients with arterial embolism and thrombosis in Poland is still associated with a relatively high mortality rate and with a high percentage of amputations (after surgical treatment: 8.6% and 5.96%, respectively; after endovascular treatment, 3.3% and 4.62%, respectively).
4. Due to the method of reporting, and to the reporting of procedures needed in order to account for given DRG, and not all performed surgeries (including amputations), the number of amputations (including major amputations) in the current analysis, based on reported procedures, may be underestimated.
5. In analysing the results of surgical treatment in this patient group, evaluating the method of referring patients to the hospital seems significant: emergency admissions, scheduled admissions, where the patient is referred from, and how long before they are admitted to the hospital. These data should be correlated with the percentage of amputations in this patient group.
6. The information on the proportion of patients who had been treated or consulted in vascular or vascular surgery clinics beforehand is also significant. 20.99% of scheduled hospitalisations in Poland were preceded within 90 days with a visit to a clinic of this type.

7. The current reporting system does not allow for any conclusions to be formed regarding the quality of treatment, with reference to the degree of ischaemia and the risk of amputation at the moment of admission to the hospital.

Pulmonary thrombosis and/or embolism

1. The mortality of patients hospitalised for pulmonary thrombosis or embolism in Poland was 4.96%. At the moment, on the basis of the available reporting system, it is not possible to determine the causes of death in this population.
2. It is justified for the further analysis to include the evaluation of the accessibility to the appropriate prehospital diagnosis of pulmonary thrombosis or embolism: an analysis of where the patient was referred from (specialist outpatient care clinic, family doctor's clinic, admission without a referral). It is also necessary to determine what part of patients had imaging studies, confirming or suggesting thrombosis, and where they were done. In this respect, analysing the accessibility to duplex Doppler ultrasound diagnosis in facilities operating in particular voivodeships (including specialist outpatient care, emergency departments, and ERs) is necessary.
3. Due to the method of reporting, it is not possible, at the moment, to determine how long it takes for a patient to have tests done to confirm or rule out thrombosis. For this, further analysis of resources and their accessibility is necessary, including the 24-hour access to diagnostic tests for patients with deep vein thrombosis.

Varicose veins of lower extremities

1. The majority of varicose veins of lower extremities surgeries provided by the public healthcare system were performed outside of vascular facilities.
2. The available reporting system does not allow for an analysis of performed surgeries from the point of view of the stage of the disease: patients with trophic changes, patients with venous leg ulcer, cosmetic procedures. In addition, for lack of data, it is not possible to evaluate the conservative treatment of a chronic vascular disease, there is no information on using compression treatment or other types of treatment.
3. On the basis of currently available data, treatment results and quality (the proportion of reoperations, the risk of varicose veins recurrence) cannot be evaluated.

Limb ulcers

1. It is not possible to conclude, on the basis of the reported data, the number of new cases of ulcers of lower extremities; there was an attempt to determine so-called reported incidence

(shown on the voivodeship maps), which indicates the minimum number of new cases, and was reported in 2014. There is no information on what population of patients with an ulcer of a lower extremity remains in the care of a family doctor or outside of the healthcare system: the reported incidence, based on the data from specialist outpatient care, emergency departments and inpatient care, relates only to a part of the patient population.

2. Proper diagnosis and causal treatment of patients with ulcers of the lower extremity, including multispecialty care dedicated to a particular pathogenesis of the ulcer (ulcers of vascular origin, diabetic foot, dermatological diseases, other causes) need to be further analysed.

3.1.5 Diseases of the respiratory system (chronic)

The analysis of the reported prevalence rates and incidence rates indicates the high prevalence of chronic disorders of the respiratory system, both in adults and children.

The substantial burden of the patient care in terms of the diagnostics and treatment of asthma in adults can be seen in the inpatient treatment (about 120 hospitalisations per 100,000 inhabitants). This leads to the conclusion that the Specialist Outpatient Care and Primary Care may be involved in the care of patients with asthma to an insufficient extent.

The analysis of the accessibility of the omalizumab drug programme, which is dedicated to patients with asthma, showed that there are no areas with the lower accessibility of this form of treatment.

Of note is the wide variation in age- and sex-standardised time of hospitalisations of patients with chronic obstructive pulmonary disease between various hospitals countrywide.

It should be noted that the accessibility to the specialist pulmonary rehabilitation is very low. In Poland, there were 20 sites providing services in terms of pulmonary rehabilitation, while in 4 voivodeships there was no site of this type.

Moreover, there are only 2 sites providing inpatient pulmonary rehabilitation services in Poland and there is no possibility of providing outpatient pulmonary rehabilitation.

Following the world trends, the number of adults with cystic fibrosis is increasing (0.8 thousand hospitalisations in Poland). The analysis showed that there are voivodeships with no facilities providing care for such patients.

Access to chronic oxygen therapy at home (home oxygen therapy - HOT) varies among voivodeships. The lowest rate per 100,000 inhabitants was 10.6 (Zachodniopomorskie Voivodeship), the highest was 63.8 (Świętokrzyskie voivodeship), with the rate of 24.3 for Poland.

Of note is the low percentage of patients with the diagnosis of Respiratory failure who were treated with noninvasive mechanical ventilation (JGP D45). In Poland, it is only 1%.

Reporting errors in terms of all chronic diseases of the respiratory system. An example is the wide variation in the percentage of status asthmaticus among all hospitalised for asthma across voivodeships

(with the highest value of 13%, the lowest of 1% and the average of 4%), or in reporting comorbidities which may be responsible for the acute states that caused the hospitalisation.

The next step should involve furthering the analysis of diagnostics in wards of pulmonology (including the diagnostics of lung cancer, which is of key importance in the prognosis of this cancer), as well as furthering the analysis of waiting time for the diagnosis and treatment of sleep apnea. Also an analysis of patients treated with CPAP financed from NFZ funds would be justified.

3.1.6 Diseases of the respiratory system (acute)

The high prevalence and high frequency of acute disorders of the respiratory system is observed, both in adults and children.

The main wards treating patients with pneumonia and bronchitis are internal diseases wards (approx. 20% of hospitalisations) and paediatric wards (approx. 40% of hospitalisations). Other acute diseases of the respiratory system are treated to a large extent in specialist wards. A clear division of competences and referral level can be seen in terms of the treatment of common and rare diseases of the respiratory system. The exception are acute respiratory failure and pulmonary edema, which, although they usually constitute a direct threat to life, are treated (reported) in approx. 30% in internal diseases and paediatric wards.

Among adult patients, a high percentage of patients (53%) aged above 65 years has been observed in terms of acute diseases of the respiratory system.

A high seasonality of acute diseases of the respiratory system has been observed both in the adult and paediatric populations. The seasonality causes variation in the utilisation of resources (e.g. hospital beds, medical staff), which poses a challenge in organising flexible healthcare.

A low percentage of performed (reported) microbiological examinations in patients hospitalised due to acute diseases of the respiratory system has been observed (for example, 16% in case of pneumonia in adults).

Due to the specific character of the disease, adult patients with tuberculosis are hospitalised for a long time (the median length of stay is 42 days for Poland). Therefore, they constitute a significant burden for pulmonary wards specialising in their treatment.

The low quality of data and lack of complete reporting of, among others, comorbidities or conducted diagnostic tests, negatively influence the possibility of determining the homogeneity of the group of patients with acute diseases of the respiratory system. This makes the determination of actual needs, e.g. in terms of pulmonary or systemic rehabilitation, in this group of patients impossible.

Acute diseases of the respiratory system, due to their specific character, are rarely treated in the outpatient setting. For example, in Mazowieckie Voivodeship, only 11% of consultations in tuberculosis and pulmonary clinics (the 8th element of the Ministry of Health code: 1270) were provided to patients

admitted with the analysed diagnoses. In case of pulmonary clinics (the 8th element of the Ministry of Health code: 1272), the respective value was 6%.

3.1.7 Endocrine diseases

In 2014, 141.5 thousand hospitalisations due to diagnoses classified as endocrine diseases were reported in Poland. The number of hospitalisations per 100,000 population was 367.61.

The diagnoses analysed here were divided into 9 subgroups. The largest subgroup in the country in terms of hospitalisations is the set of ICD-10 diagnosis, called benign endocrine neoplasms. Hospitalisations with the diagnosis belonging to this subgroup accounted for more than every fourth hospitalisation (26.9%), which is largely related to the assignment of strumanodosa and prolactinoma to this group. Diseases with unspecified endocrine diagnosis were the second largest subgroup in terms of hospitalisations (22.7% of hospitalisations). This subgroup includes patients undergoing endocrine diagnostics which requires examinations over a longer period of time. The third most frequent diagnosis group referred to the disorders of reproductive glands, which is caused by the frequent occurrence of gynaecological/endocrine diseases.

The analysis showed a substantial difference in the ratio of hospitalisations per 100,000 adults (329.45), and 100,000 children (540.93). This is due to the fact that the diagnosis of the endocrine diseases is often conducted only in childhood, and adult patients often require outpatient treatment only.

Almost three quarters of all hospitalisations among adult patients took place in three wards: endocrinology ward (28.1% of hospitalisations), internal diseases ward (25% of hospitalisations) and general surgery ward (21% of hospitalisations).

Analysis of hospitalisations of children showed the highest occupancy rate (almost two thirds of all hospitalisations) in wards: paediatric endocrinology ward (37.7% of hospitalisations), paediatric ward (28.1% hospitalisations).

The group of endocrine diseases was characterised by low in-hospital mortality (types of patients' discharge characterised as death). In case of children, this ratio amounted to approx. 0.02%, and approx. 1.5% in case of adults.

High significance in the treatment of patients with endocrine diseases has the Specialist Outpatient Care. 83.7% of outpatient visits with the diagnosis belonging to this group took place in endocrine clinics and paediatric endocrine clinics. A comparison of the number of consultations reported in the NFZ and consultations reported through the ZD-3 report showed that more than 20% of consultations in clinics of this type were not financed from public funds. It should be emphasised that this figures correspond to the minimum estimated percentage of consultations provided outside the NFZ.

3.1.8 Childhood diseases

In Poland, 1,374.8 thousand hospitalisations of people under the age of 18 (hereinafter: children) were reported, which translated into 19,801.61 hospitalisations per 100,000 children. On the other hand, the number of hospitalisations of children with diagnoses classified as general paediatrics amounted in Poland to 559.6 thousand, which translated into 8,059.83 hospitalisations per 100,000 children. The most frequent group of general paediatric diagnoses in Poland were diseases of the respiratory system (32.4% of all general paediatric hospitalisations in the country) and the gastrointestinal tract diseases (29.9%).

In Poland, 70.8% of hospitalisations with general paediatrics diagnoses were reported within the paediatrics scope. General paediatrics hospitalisations are reported also within the specialist paediatrics scopes (29.2% in Poland). 69.1% of hospitalisations with general paediatrics diagnoses were reported in paediatric wards.

General paediatrics hospitalisations are characterised by high seasonality. It is influenced mainly by the 0-5 age group. At the same time, a significant decentralisation of general paediatrics treatment is observed – many hospitals (172) report even fewer than 100 hospitalisations per year. Most of them (28) were recorded in Mazowieckie Voivodeship. In Poland, the percentage of hospitalisations finished with further hospitalisation at any hospital within 30 days from the day of discharge was 5.6%. This value varies among voivodeships from 2.1% in Zachodniopomorskie Voivodeship, up to 6.6% in Lubelskie Voivodeship.

A forecasting model was developed for general paediatrics hospitalisations in hospitals with a general paediatrics ward (in accordance with the 8th part of the Ministry of Health code), which is based on the demographic forecast of the Central Statistical Office for counties and the assumption of constant hospitalisation rates within age groups. The obtained results indicate that in the years 2014-2020 we will observe the decrease in the number of general paediatric hospitalisations of approx. 31 thousand, and the number of hospitals reporting at least 700 such hospitalisations will decrease from 283 to 267.

3.1.9 Mental disorders

The incidence of mental disorders in Poland

Due to the lack of population-based epidemiological studies regarding most health conditions analysed in this document and the lack of medical registers, an attempt was made to estimate them. Although some discrepancies were found between the estimated epidemiological indicators and source data from the literature on the epidemiological indicators in other EU countries, and single reports from the country, the obtained data can be treated as the currently best possible estimation of these indicators.

The reported prevalence estimated as of 31 December 2014 under the treatment of addictions amounted to 933.4 thousand of patients (2,456.4 patients per 100,000 inhabitants). For schizophrenia,

the number of patients in Poland was estimated to be 279.4 thousand (calculated per 100,000 inhabitants: 735.2 patients). The number of patients suffering from organic disorders was 695.2 thousand (calculated per 100,000 inhabitants: it was 1,829.5 patients). The reported prevalence for behavioural and emotional disorders with onset usually occurring in childhood and adolescence amounted to 370 thousand of patients (973.6 patients per 100,000 inhabitants).

Inpatient Healthcare - Mental Disorders

Most hospitalisations were reported in the type of service 'outpatient care and treatment of addictions' (the 4th type of services according to the NFZ). In Poland, 97% of hospitalisations take place due to mental disorders. The reported hospitalisations of the type 'inpatient treatment' (the 3rd type of services according to the NFZ) accounted for 3% of hospitalisations in the country. Hospitalisations under the inpatient care (the 3rd type of services according to the NFZ) were dominant among service providers reporting fewer than 20% of hospitalisations in the voivodeship.

Due to the specific character of the treatment of mental disorders, disease groups for adults and for children and adolescents were distinguished in the analysis. The highest percentage of hospitalisations among the adults in the country referred to addictions (44% of hospitalisations in the country). When it comes to children and adolescents, the highest percentage of hospitalisations in the country referred to neurotic, stress-related and somatoform disorders (16.5% of hospitalisations in the country).

In Poland, in 2014, 3.1 thousand hospitalisations were recorded in forensic psychiatry wards. For the entire country, the number of service providers who hospitalised at least one adult patient was 24, out of which more than 80% of hospitalisations were reported by half of them. The number of service providers who hospitalised patients under the age of 18 was 5. The most frequent cause of hospitalisation in case of adults was schizophrenia (1.56 thousand hospitalisations), and hyperkinetic disorders and behavioural disorders in case of children and adolescents.

An important element, from the perspective of treatment of psychiatric disorders in Poland is the comprehensiveness of psychiatric facilities. Taking into account, whether the service provider disposed in 2014 of an outpatient ward, a psychiatric clinic, an ER or a hospital emergency department, a community mental health team and an inpatient ward, it can be concluded that there were 25 facilities in Poland which included all aforementioned forms of treatment in one county.

Taking into account, whether in 2014 the service provider disposed of an outpatient ward for children and adolescents, a psychiatric clinic for children and adolescents, an ER for children and adolescents or a hospital emergency department for children and adolescents, a community mental health team and an inpatient ward for children and adolescents, it can be concluded that there were no facility in Poland which included all aforementioned forms of treatment in one county.

Psychiatric Outpatient Care

In 2014, 8.37 million consultations provided for 1.5 million patients were recorded under outpatient care services for adults (including community mental health teams and psychiatric clinics). The average number of consultations per patient within a year was 6.

In 2014, 1.73 million consultations provided for 0.28 million children were recorded under outpatient care services for children and adolescents (including community mental health teams and psychiatric clinics). The average number of consultations per patient within a year was 6.

In 2014, outpatient care services for adults included mainly general psychiatric services, which constituted 60.1% of all consultations. In profiled services, the treatment of addictions (30.5%) was dominant.

In 2014, in Poland, almost half of consultations for children and adolescents were provided in a speech therapy clinic (48%). In the mental health clinic for children, approx. 25% of consultations were provided. In case of the mental health clinic for children, voivodeships varied in terms of the number of consultations per clinic. The highest value was observed in Kujawsko-Pomorskie Voivodeship (4.26 consultations per clinic), and the lowest in Lubuskie Voivodeship (1.35 consultations per clinic).

3.1.10. Pregnancy, childbirth and the puerperium, and neonatal care

In the part referring to the inpatient care in case of pregnancy, childbirth and the puerperium, services financed from public funds were analysed in four thematic blocks: deliveries, pregnancy disorders, pregnancy with abortive outcome and complications related to the puerperium. The analysis included inpatient services with diagnoses from categories O00–O99, Z32–Z36 and Z39 according to the 10th revision of the International Statistical Classification of Diseases and Related Health Problems (ICD–10).

In the part referring to the inpatient care in case of neonatal care, the analysis included services with diagnoses from categories P00–O96, R09 and Z38 according to the 10th revision of the International Statistical Classification of Diseases and Related Health Problems (ICD–10).

Among deliveries, four subgroups were identified: complicated unassisted deliveries, complicated assisted deliveries, uncomplicated unassisted deliveries and uncomplicated assisted deliveries. The complication of a delivery was determined on the basis of the ICD-10 diagnosis and reported Diagnosis-Related Groups (DRGs). The fact, whether the delivery was assisted, was determined on the basis of reporting procedures (assisted procedures include caesarean section, vacuum and forceps-assisted deliveries). Among pregnancy disorders, severe and minor disordered were identified.

The number of deliveries reported in inpatient care in 2014 in Poland was nearly 430 thousand. It is the minimal value of the number of pregnancies in Poland, as miscarriages not reported in inpatient care and pregnancies managed completely outside of the healthcare system financed by the public payer

(the NFZ) were not included in the analysis. In Poland, in 2014, 61.5 thousand pregnancies with abortive outcome were recorded in inpatient care.

In Poland, in 2014, approx. 365 thousand deliveries were reported under contracts with the NFZ. Out of these deliveries, about 160 thousand were uncomplicated unassisted deliveries, 99 thousand uncomplicated assisted deliveries, 59 thousand complicated assisted deliveries and 47 thousand complicated unassisted deliveries. Therefore, the total number of recorded assisted deliveries was 158 thousand, and of the unassisted deliveries – 207 thousand. Out of the complicated deliveries, about 15.8 thousand were preterm labours.

In 2014, about 359 thousand neonatal hospitalisations were reported in Poland. Among them, 211 thousand were reported as a part of the N20 Diagnosis-Related Groups (Newborn requiring normal care). This means that out of 100 neonatal hospitalisations, only 59 referred to the care for fully healthy newborns. Among the service providers, the values of the aforementioned indicator are highly varied. In particular, one can distinguish those where the dominant Diagnosis-Related Group is not N01, i.e. the service providers who reported most hospitalisations of newborns requiring intensive care.

Average length of stay (hereinafter: ALOS) in Poland in the **pregnancy with abortive outcome** group amounted to 2.15 days. The highest value was recorded in Świętokrzyskie (2.93) and Łódzkie (2.72) Voivodeships, and the lowest in Pomorskie (1.85) and Podlaskie (1.87) Voivodeships.

In case of the **minor pregnancy disorders**, ALOS in Poland, in 2014, amounted to 3.64 days. Among the voivodeships, the highest value was recorded in Lubelskie (4.38) and Małopolskie (4.32) Voivodeships, and the lowest in Kujawsko-Pomorskie (2.91) and Wielkopolskie (3.05) Voivodeships. In case of the **severe pregnancy disorders**, ALOS in the country amounted to 4.43 days. The highest value was recorded in Warmińsko-Mazurskie (6.79) and Śląskie (6.41) Voivodeships, and the lowest in Wielkopolskie (3.22) and Zachodniopomorskie (3.28) Voivodeships.

ALOS for deliveries in Poland had the following values. In case of **complicated assisted deliveries**, it amounted to 9.25 days. The differences among voivodeships in this respect amounted to nearly four days. The highest ALOS was recorded in Śląskie (11.93) and Warmińsko-Mazurskie (10.63) Voivodeships, and the lowest in Pomorskie (8.04) and Wielkopolskie (8.13) Voivodeships. In case of **complicated unassisted deliveries**, the average number of person-days of hospitalisations was 6.93 days. Among the voivodeships, the highest value was recorded in Lubuskie (10.02), and the lowest in Pomorskie (5.88) Voivodeships.

Uncomplicated deliveries were characterised by a lower average length of stay. In Poland, they levelled at 4.77 days for **uncomplicated assisted deliveries** and 3.84 days for **uncomplicated unassisted deliveries**. In both groups, the highest ALOS was that of Lubelskie Voivodeship (4.86 for unassisted and 5.79 for assisted deliveries). On average, patients were hospitalised for the shortest period of time in Podlaskie Voivodeship (3.71 days) for uncomplicated assisted deliveries and Kujawsko-Pomorskie Voivodeship (3.37 days) for uncomplicated unassisted deliveries.

The average length of hospitalisation **for neonatology** in Poland was 4.6 days.

A risk-weighted spontaneous delivery ratio (RWSDR) is the relationship between the reported number of spontaneous (i.e. uncomplicated unassisted) deliveries and the expected number of such deliveries in the facility. The expected number of spontaneous deliveries was assessed taking into consideration the structure of women giving birth in terms of pregnancy disorders, age and previous caesarean sections. The ratio should be interpreted as follows. The value 1 means that spontaneous deliveries in a hospital were observed as frequently as they are reported on average in Poland. Ratio values below 1 indicate a higher incidence of assisted and/or complicated deliveries than on average in Poland (considering the aforementioned stricture), and ratio values above 1 indicate a higher incidence of spontaneous deliveries than the average for hospitals at the same referral level.

At the national level, the following regularities can be observed. For the first and the second referral level, the value of RWSDR positively correlates with the annual number of deliveries in the hospital. In other words, the more deliveries are reported by the hospital at the first or second referral level, the higher is the percentage of spontaneous deliveries. In case of the third referral level, the inverse correlation is observed, i.e. the more deliveries were reported in 2014, the smaller part of these deliveries were spontaneous deliveries.

For the first and second referral level, the highest RWSDR values were reported by Pomorskie Voivodeship (1.16 and 1.25, respectively). This means that 16% more spontaneous deliveries for the second referral level were reported in the voivodeship than it would result from the structure of patients in this voivodeship, and 25% more for the second referral level. The rate for the first referral level was the lowest in Opolskie Voivodeship (0.78), and in Dolnośląskie Voivodeship (0.74) for the second referral level. Dolnośląskie Voivodeship recorded also the lowest RWSDR for the third referral level. At this level, the highest value was recorded in Kujawsko-Pomorskie Voivodeship (1.38). The various values of RWSDR among voivodeships result from the differences between the service providers. The values of the Risk-Weighted Spontaneous Delivery Ratio for service providers were presented in the map of healthcare needs.

The rate of caesarean sections for uncomplicated pregnancies with no previous caesarean sections reported is defined as the number of caesarean section births per 100 births ending uncomplicated pregnancies for which no previous caesarean sections have been reported. An uncomplicated pregnancy is defined as one during which the patient was hospitalised due to any pregnancy disorders (either minor or severe) and the delivery was not classified as complicated. It is assumed to be the ratio which indicates to the best possible extent the scale of caesarean sections "on demand" performed in the voivodeship and by individual healthcare providers.

At the national level, it can be observed that the number of deliveries in the hospital negatively correlates with the number of caesarean sections for uncomplicated pregnancies with no previous caesarean sections reported. This means that in Poland, on average, the more delivery procedures were managed by the service provider, the less frequently did it perform caesarean sections in case of uncomplicated pregnancies, where no performed caesarean section was reported in the previous years.

At the national level, the rate was 28.9. Among voivodeships, the highest value was recorded in Zachodniopomorskie (38.9), Podlaskie (37.8), Dolnośląskie (33.7) and Śląskie (33.2) Voivodeships, and

the lowest in Wielkopolskie (19.7), Pomorskie (21.2), Kujawsko-Pomorskie (21.3) and Lubelskie (25.0) Voivodeships.

At the national level, it can be observed that the number of deliveries in the hospital negatively correlates with the number of spontaneous deliveries after previous caesarean sections for uncomplicated pregnancies (the number of spontaneous deliveries per 100 births ending uncomplicated pregnancies (defined as above) among patients who gave birth in the past by means of caesarean sections). This means that in Poland, on average, the more delivery procedures were managed by the service provider, the more frequently did it carry out spontaneous (uncomplicated unassisted) deliveries in case of uncomplicated pregnancies, where a performed caesarean section was reported in the previous years.

At the national level, the rate was 9.23. Among voivodeships, Pomorskie Voivodeship was particularly distinguishable, with the highest value of the discussed variable was (25.8). The value was higher by almost 10 from the second highest among voivodeships (16.6, Kujawsko-Pomorskie Voivodeship). The lowest values were these of the voivodeships from the south-eastern part of Poland: Podkarpackie (4.9), Małopolskie (5.0), Świętokrzyskie (5.2) and Śląskie (6.3) Voivodeships.

Due to the low value of the denominator, the spontaneous delivery ratio after previous caesarean sections for uncomplicated pregnancies per hospital should be analysed only for the biggest service providers in a voivodeship.

The episiotomy rate for uncomplicated spontaneous deliveries is defined as the number of deliveries during which episiotomy with subsequent episiorrhaphy was performed per 100 uncomplicated spontaneous deliveries. An uncomplicated spontaneous delivery is defined as a delivery classified in the spontaneous delivery group following pregnancy during which the patient was not hospitalised due to any complications (either minor or severe) and for which no previous caesarean section was reported.

At the national level, it can be observed that the number of deliveries in the hospital negatively correlates with the number of spontaneous deliveries for uncomplicated pregnancies.

The highest values of the discussed ratio were these of Łódzkie (66.1) and Pomorskie (63.6) Voivodeships. The lowest values, in turn, were recorded in Kujawsko-Pomorskie (41.6), Lubelskie (51.0) and Zachodniopomorskie (51.1) Voivodeships.

In Poland, in 2014, there were 395 facilities reporting deliveries. Among those facilities, 310 carried out in 2014 at least 400 deliveries (76%).

In accordance with the results of the model, in 2020, among service providers currently functioning in Poland, 301 show the potential for carrying out at least 400 deliveries, or are necessary from the point of view of the quick access to primary care midwife services (with the exception from the applied rule of 400 deliveries constituted by maternity sites which were the only ones providing services within the radius of 40 km). In all other cases, the need for retaining a maternity-related ward should be reconsidered.

The functioning of neonatal wards and subunits (including those which are sections of a larger maternity/gynaecology and obstetrics ward structure) is strictly related to the functioning of maternity wards. .

Therefore, forecast results will have a direct impact on recommendations for those wards: in hospital where the number of childbirths does not reach the threshold value, the need for both a maternity/gynaecology and obstetrics ward (within the scope of labour and delivery) and a neonatal ward/subunit should be reconsidered.

3.1.11 Diabetes mellitus

The insufficient number of epidemiological studies in Poland necessitated certain approximations and estimation of the epidemiological indicators (namely, reported incidence rates and reported prevalence rates) based on the data from the National Health Fund.

For the purposes of analysing the number of new cases for a particular chronic disease, we estimated the reported incidence rate, defined as the number of new patients with this diagnosis who appeared in the public healthcare system.

For chronic diseases, the reported incidence was calculated for 2014 based on the NFZ data for the period from 2009 to 2015 (it was possible to analyse the patient's history up to five years back and one year ahead - in case of diabetes it was an appearance of a patient with such diagnosis in specialist outpatient care, emergency departments or hospital). A patient that appeared in the NFZ reporting system during this period was considered a new patient (a first-time patient) if 2014 was the year in which he or she appeared in the system with a given diagnosis for the first time.

Based on the adopted assumptions, the recorded incidence of diabetes mellitus was determined, which amounted in 2014 to 143.70 thousand people in Poland (378.2 people/100,000 inhabitants). It should be however emphasized that adopting a different method to determine recorded incidence, e.g. based on the information on patients taking diabetes medication and using glucose test strips, the estimated value of recorded incidence would be much higher.

Hospital Care

In 2014, 87.5 thousand hospitalisations due to diabetes were reported in Poland. Voivodeships vary in terms of the number of hospitalisation per 100,000 population; the lowest value was recorded in Pomorskie Voivodeship (160.6); and the highest in Łódzkie Voivodeship (291.3).

Hospitalisations of adults due to diabetes mellitus take place predominantly on internal medicine and diabetes wards (total of 77%). When it comes to the scope, the treatment is mainly settled within the group of internal diseases and diabetes (approx. 84%).

In case of children, the dominant ward/scope is this of paediatric diabetes or ward/scope of paediatric endocrinology – substantial differences occur among voivodeships.

The hospitalisations of adult patients are emergency admissions (67%), contrary to hospitalisations of children, which constitute mainly scheduled admissions (approx. 66%).

The average length of stay due to hospitalisation for diabetes mellitus was 7.8 days in Poland in case of adults, and 4.6 days in case of children. The average age of a hospitalised adult patient is 62.7 years, and according to the Charlson index, the average share of patients with the index higher than 0 was 40%.

This suggests that diabetes mellitus is a disease that co-occurs with many others. In Poland, diabetes mellitus was most often reported as a comorbidity in hospitalisations due to the following diagnoses (according to ICD-10): E66 - Obesity (24% of hospitalisations), E78 - Metabolic, lipoprotein and lipidemic disorders (18% of hospitalisations).

Specialist Outpatient Care

The number of consultations in diabetes clinics for adults and paediatric diabetes clinics per 100,000 population in Poland was in 2014 different among voivodeships.

In case of adults, the ratio was highest in Podlaskie Voivodeship (8.59 thousand), and the lowest in Lubuskie Voivodeship (4.06 thousand).

In case of children, the ratio was highest in Świętokrzyskie voivodeship (1.38 thousand), and there was no clinic which reported services to the NFZ in Opolskie Voivodeship.

In both types of clinics, W11 services were dominant – specialist healthcare service type 1.

At the same time, it should be noted that the services were mainly provided to patients who visited a clinic 3 times or more within a year – the percentage of this type of consultations was 73.46% for adults and 84.91% for children (average values for Poland).

A part of these services could be provided as primary care services. In order to assess the number of such consultations, the next step should involve conducting an analysis consisting in separating the group of patients treated with insulin.

While comparing the number of consultations reported for public statistics (the ZD-3 form including information on the total number of consultations in diabetes clinics and paediatric diabetes clinics) with the data from the NFZ database, it should be concluded that 5.8% of services in Poland were financed from private funds (these values vary among voivodeships). However, due to the quality of data in ZD-3 reports, this value should be treated as the minimal value.

3.1.12 Neoplasms of haematopoietic or lymphoid tissue

In 2014, 52.5 thousand hospitalisations due to diagnoses classified as neoplasms of haematopoietic or lymphoid tissue in adults were reported in Poland. Number of hospitalisations per 100,000 inhabitants was 166.44.

The diagnoses analysed here were divided into 7 subgroups. The largest subgroup in the country in terms of hospitalisations is the set of ICD-10 diagnosis called Mature B-cell neoplasms. Hospitalisations with the diagnosis belonging to this subgroup accounted for 43.3% hospitalisations of the group.

Due to the lack of population-based epidemiological studies regarding most health conditions analysed in this document and the lack of medical registers, an attempt was made to estimate them. Although some discrepancies were found between the estimated epidemiological indicators and source data from the literature on the epidemiological indicators in other EU countries, and single reports from the country, the obtained data can be treated as the currently best possible estimation of these indicators.

According to experts working with the Ministry of Health, the low quality of reporting data or discrepancies between ICD-10 codes and the current classification of neoplasms of haematopoietic tissue recommended by WHO (World Health Organization) as well as misdiagnoses result in possible overestimations of incidence in Poland. However, the obtained data are the best results which can be currently assessed.

The centralisation of services is recommended for the analysed group of diseases. Nevertheless, it should be emphasized that a part of services of a not highly specialist nature, provided to patients with the analysed diagnoses, could be conducted on internal medicine wards.

Acute neoplasms of haematopoietic tissue

Substantial discrepancies occur in the reported data relating to the reported hospital discharges ("end of treatment" and "referral to further treatment"). In the opinion of experts cooperating with the Ministry of Health, for the patients with acute neoplasms of haematopoietic tissue the "end of treatment" hospital discharge translates into referring the patient to the symptomatic treatment only, which could be conducted closer to the patient's place of residence.

There is a noticeable concentration of services provided for this group of diseases, which in case of diagnostic hospitalisations suggests that the facilities in question are highly specialised. In case of hospitalisations due to transfusion of blood components or treatment of infections, this indicates that patients are not successfully referred to facilities located closer to their place of residence.

Chronic neoplasms of haematopoietic tissue

In Poland, 2.2 thousand patients were treated under the medication programme titled "Treatment of chronic myeloid leukaemia". The implementation of this programme in Poland took place in 32 facilities, though it should be noted that 64% of patients were treated in ten facilities.

The utilisation rate of hospitalisations in order to implement this medication programme varies significantly among healthcare providers in Poland (it ranges from 0 to 100%). This means that a part of service providers implements the aforementioned medication programme only within the inpatient, and another part only within the outpatient procedure.

Substantial discrepancies occur in the reported hospital discharges ("end of treatment" and "referral to further treatment"). In the opinion of medical experts, for the patients with chronic neoplasms of haematopoietic tissue the "end of treatment" hospital discharge translates into referring the patient to the hospice/home care only or the symptomatic treatment only, which could be conducted closer to the patient's place of residence.

Blood transfusion in neoplasms of haematopoietic tissue

A high percentage of rehospitalisation within 30 days, concerning the patients with diagnosed neoplasms of haematopoietic tissue, may result from the need of transfusing specific blood components, treating infectious complications, as well as the comorbidity, which mainly refers to the elderly patients. Facilities characterised by the short length of stay and low index of rehospitalisation most probably perform single transfusions of blood components, and facilities with high index of rehospitalisation with the sort length of stay – multiple transfusions of blood components.

Mature B-cell neoplasms

In Poland, 1.8 thousand patients were treated under the medication programme titled "Treatment of malignant lymphoma". Mazowieckie Voivodeship is the first voivodeship in Poland in terms of the size of positive migration rate in the aforementioned medication programme. The implementation of this programme in Poland took place in 72 facilities, though it should be noted that 10.2% of patients were treated in one facility.

The percentage of one-day hospitalisations in order to implement this medication programme varies significantly among healthcare providers in Poland (values from 0 to 100%). The grounds for hospitalisations require further analysis.

In Poland, 0.8 thousand patients were treated under the medication programme titled "Lenalidomide in treatment of patients with resistant or recurring multiple myeloma". Mazowieckie Voivodeship is the first voivodeship in Poland in terms of the size of positive migration rate in the aforementioned medication programme. The implementation of this programme in Poland took place in 38 facilities.

Precursor B- and T-cell neoplasms

Recorded incidence in Poland amounts to 0.8 cases per 100,000 inhabitants. In turn, according to the European data, in the elderly aged 74 y.o. and over, the value amounts to 1.45 cases per 100,000 inhabitants. Underestimation of the recorded incidence, or the low diagnosis rates of Precursor B- and T-cell neoplasms can result from the lack of diagnostics standards which would facilitate the proper diagnosis on the internal diseases ward or while providing primary healthcare services.

Mature B-, T- and NK-cell neoplasms

The concentration of treatment of patients with mature B-cell neoplasms in Mazowieckie, Dolnośląskie and Śląskie Voivodeships is recorded (voivodeships with the highest migration rate).

In several facilities, substantial discrepancies occur in the reported hospital discharges ("end of treatment" and "referral to further treatment"). According to the experts assisting the Ministry of Health, the majority patients with mature B-cell neoplasms require treatment and/or observation under AOS.

Hodgkin lymphoma

According to experts working with the Ministry of Health, it is not possible to code specific histopathological subtypes of Hodgkin lymphoma to the most precise extent, due to the fact that the most recent version of the ICD-10, together with the reported estimated prevalence, is not included in the reporting.

Transplantations

In 2014, 1.3 thousand transplants were made in Poland. In the geographic distribution of hospitals providing bone marrow transplantations, the lack of such facilities is noteworthy in the following voivodeships: Warmińsko-Mazurskie, Podlaskie, Zachodniopomorskie, Lubuskie, Podkarpackie and Świętokrzyskie (the facility was opened in 2015).

3.1.13 Diseases of blood and immune system

In 2014, about 77 thousand hospitalisations due to diagnoses classified as diseases of blood and immune system were reported in Poland. Number of hospitalisations per 100,000 population was 200.4.

Due to the lack of population-based epidemiological studies regarding most health conditions analysed in this document and the lack of medical registers, an attempt was made to estimate them.

Although some discrepancies were found between the estimated epidemiological indicators and source data from the literature on the epidemiological indicators in other EU countries, and single reports from the country, the obtained data can be treated as the currently best possible estimation of these indicators.

The statistics presented in the Map of Healthcare Needs for the 'Diseases of blood and immune system' group might be, in the opinion of medical experts working with the Ministry of Health and according to data presented in literature, understated to a lesser or greater extent, which results directly from the quality of the reporting data, especially as far as the reporting of ICD-10 diagnoses is concerned.

The diagnoses analysed here were divided into 12 subgroups of diagnoses. They included 9 diseases of blood, and 3 diseases of the immune system. The largest in terms of the number of hospitalisations among adults is the subgroup "Other anaemias", and among hospitalisations in children, ICD10 codes from the subgroup "Coagulation defects and other haemorrhagic conditions (acquired)" were reported the most frequently.

During the treatment of the diseases of the immune system, an important factor are transfusions of immunoglobulin. In individual voivodeship maps the number of immunoglobulin transfusions performed in 2014 was analysed. The analysis showed, among others, that the average time between encounters when transfusions were performed vary among diagnosis subgroups and amounted to 35.2 days for diseases of the immune system (primary), 40 days for diseases of the immune system (secondary), and 36.8 days for diseases of the immune system (unspecified). It should be emphasized that the values of the aforementioned variable varied also among individual voivodeships.

According to the experts assisting the Ministry of Health, diagnostics and treatment of deficiency anaemias do not require highly specialised haematology procedures, so they can be performed closed to the patient's home, in primary care settings, and any necessary hospital-based diagnostics can be provided in units other than specialised haematology wards.

A vast majority of healthcare providers hospitalise patients with deficiency anaemias on internal medicine wards on an emergency basis, although emergency admission should be for patients with severe, life-threatening anaemia. A further, more in-depth analysis is recommended in order to find out whether patients hospitalised on an emergency basis appeared in the healthcare system for the first time. Correct diagnostics and properly implemented and monitored treatment in primary care eliminates almost completely the need for emergency admissions.

Scheduled hospitalisations of patients with deficiency anaemias may result from the need to administer intravenous iron preparations. Due to the risk of hypersensitivity reactions, intravenous iron preparations have to be administered by trained staff in a location with readily available resuscitation equipment. After

the administration of intravenous iron preparations, the patient should be monitored for at least 30 minutes.

Administration of intravenous iron preparations in inpatient settings may pose a burden for haematology wards providing day care chemotherapy. Administration of intravenous iron preparations as part of day care units other than specialised haematology wards, e.g. internal medicine wards or hospital treatment rooms could have a positive impact on the availability of the service in question.

In AOS, when it comes to patients with diseases of blood and immune system, 92% of services were provided in 7 types of clinics: haematology, paediatric haematology, immunology, paediatric oncology and haematology, paediatric immunology and hemato-oncology clinics. Consultations from the first two types of clinics constituted almost 80% of all consultations provided to patients with diseases of blood and immune system.

3.1.14 Benign neoplasms

The total number of hospitalisations with a diagnosis from the benign neoplasms and neoplasms of an uncertain or unknown character group (excluding those patients that were later diagnosed with cancer and as such have already been included in the Map of Healthcare Needs for Poland – Oncology) was 280 thousand; 80% of those hospitalisations were reported by 315 healthcare providers (37.02% of providers reporting hospitalisations from the analysed group). During the analysis the varied percentage of surgical hospitalisations was recorded. In case of benign neoplasms, a high rate of surgical hospitalisations should be considered correct.

The data indicate that the average length of stay vary among different service providers. In case of the group of benign neoplasms (including those of uncertain or unknown character), the average length of stay for Poland is 3.9 days. In the analysed subgroups, the average time of stay was recorded for the subgroup of benign neoplasms of the urinary tract (9.9 days), and the shortest for the subgroup of neoplasms of respiratory and intrathoracic organs (1.5 days). For healthcare providers with the long average length of stay, it is justified to analyse this phenomenon considering the fact that it may result from a difficult access to the histopathological laboratory. This in turn is connected with the longer waiting time for the results of the final histopathological test or the comorbidity index (patients with a greater burden require a longer preparation for the procedure and related hospitalisation).

The analysed disease group includes a large proportion of diagnoses of uncertain or unknown character (41.71% in Poland, 116 thousand hospitalisations). The data may suggest imprecise reporting and diagnoses in terms of the analysed group of diseases, as well as the inability to carry out the full diagnosis of the patient or to obtain the final results of the histopathological test before the discharge of a patient. The situation can be also influenced by the lack of unified histopathological classification in histopathological laboratories. At the same time, it should be emphasized that for 84 thousand hospitalisations with a diagnosis of an uncertain or unknown character, patients who were later

diagnosed with benign neoplasms. This was the case in 55.15% of hospitalisations due to neoplasms of an uncertain or unknown character.

3.1.15 Congenital disorders

In the majority of congenital disorders, the overall incidence (including termination of pregnancy and stillbirth) in Poland and in EU countries is similar. In Poland, a higher incidence of some congenital disorders was found, such as:

- Cleft lip and/or palate
- Polydactyly,
- Deficiencies of the limbs,
- Spina bifida.

In the case of particularly serious disorders, there are significant differences between Poland and the EU countries in the prevalence of congenital disorders in live births, resulting from the termination of pregnancy after prenatal diagnosis of a disorder in many European countries. It is advisable to:

- Monitor the prevalence of congenital disorder in children in Poland. When analysing the problems related to congenital disorders, it is necessary to take into account the Polish incidence of congenital disorders among live births (data from other EU countries cannot be used),
- monitor the prevalence of congenital disorder in children in Poland. When analysing the problems related to congenital disorders, it is necessary to take into account the Polish incidence of congenital disorders among live births (data from other EU countries cannot be used),
- strive to obtain complete data on congenital disorders in Poland – in terms of live births, stillbirths, and termination of pregnancy. The combination of data from the Polish Register of Congenital Disorders with data from the NFZ will allow obtaining reliable and complete data on the incidence of congenital disorders in children in the Polish population,
- improve the coding standards of congenital disorders for children in the current medical records,
- monitor the influence of assisted reproduction methods and prenatal diagnosis on the frequency of congenital disorders in the population.

In Poland, there is unequal access to specialist outpatient care for children with congenital disorders. This is particularly visible in the genetic care in terms of AOS and SOK, where there are very substantial differences between individual voivodeships. In genetics clinics, the number of consultations per 100,000 population ranges from 24 in Podkarpackie Voivodeship to 1,088 in Zachodniopomorskie Voivodeship. However, it should be taken into account that in some voivodeships some of these consultations concern tests related to oncology.

The development of facilities dealing with foetal therapy should be predicted. The development of medical procedures that save lives and reduce the degree of disability, referring to the foetus with disorders, is also expected. It is connected with the further development of prenatal diagnosis. It is advisable to observe access to ultrasound scans and prenatal diagnosis as well as modern methods of genetic testing (aCGH and NGS), which are recognized in the EU as first-line genetic tests in children with disorders.

In view of the higher prevalence of serious disorders in live births in Poland compared to other EU countries, preventive actions become particularly important. They include education addressed to the population of childbearing age (previous procreation, awareness of the importance of reproductive health, avoidance of mutagenic and teratogenic factors, identification of families at genetic risk and the provision of genetic counselling to them, etc.).

Due to the much higher incidence of neural tube defects in Poland among live births compared to other EU countries, it is necessary to promote the intake of folic acid by women of childbearing age and to monitor the state of the prevention with folic acid and the effects obtained.

There are substantial differences between voivodeships in the number of hospitalizations per 100,000 residents. The highest values occur in Łódź and Mazowieckie Voivodeships, in which there are large centres treating patients with congenital disorders. Percentage of hospitalization of patients from outside the voivodeship for these voivodeships is over 18. Number of hospitalizations per 100,000 children was 1,176.6 and 1,053, respectively. The lowest value of this parameter is 583.3 for Podkarpackie Voivodeship.

There is a high concentration of hospitalizations in the largest voivodeship and national centres. This is the desired situation. Hospitals with single patients with congenital disorders should be observed.

There are service providers with single patients with diagnoses that should be treated in neonatal age. If these are surgical hospitalizations, the hospital's experience raises concerns, if obstetrics and gynaecology wards, this corresponds to poor prenatal care, because newborns with a suspected disease should be born in specialised facilities (with extensive experience).

Service providers who report the treatment with individual specialist procedures. The focus should be on the concentration of specialist cases. Reporting of disorders by maternity hospitals with a lower reference level shows the shortcomings in the prenatal diagnosis. Children with disorders should be born in specialized facilities, where they will receive help without the need of transport.

The analysis of the reporting data allows observing the problem of reporting surgical procedures in newborns. The focus should be on the improvement of reporting in this respect.

3.2 Inpatient Healthcare (Module B)

3.2.1 Metabolic diseases

In 2014, 141.5 thousand hospitalisations due to diagnoses classified as endocrine diseases were reported in Poland. Number of hospitalisations per 100,000 population was 367.61.

The diagnoses analysed here were divided into 9 subgroups. The largest subgroup in the country in terms of hospitalisations is the set of ICD-10 diagnosis, called benign endocrine neoplasms. Hospitalisations with the diagnosis belonging to this subgroup accounted for more than every fourth hospitalisation (26.9%), which is largely related to the assignment of strumanodosa and prolactinoma to this group. Diseases with unspecified endocrine diagnosis were the second largest subgroup in terms of hospitalisations (22.7% of hospitalisations). This subgroup includes patients undergoing endocrine diagnostics which requires examinations over a longer period of time. The third most frequent diagnosis group referred to the disorders of reproductive glands, which is caused by the frequent occurrence of gynaecological/endocrine diseases.

The analysis showed a substantial difference in the ratio of hospitalisations per 100,000 adults (329.45), and 100,000 children (540.93). This is due to the fact that the diagnosis of the endocrine diseases is often conducted only in childhood, and adult patients often require outpatient treatment only.

Almost three quarters of all hospitalisations among adult patients took place in three wards: endocrinology ward (28.1% of hospitalisations), internal diseases ward (25% of hospitalisations) and general surgery ward (21% of hospitalisations).

Analysis of hospitalisations of children showed the highest occupancy rate (almost two thirds of all hospitalisations) in wards: paediatric endocrinology ward (37.7% of hospitalisations), and paediatric ward (28.1% hospitalisations).

The group of endocrine diseases was characterised by low in-hospital mortality (types of patients' discharge characterised as death). In case of children, this ratio amounted to approx. 0.02%, and approx. 1.5% in case of adults.

The analysis of the number of hospitalizations in relation to wards where hospital care services in terms of metabolic diseases are provided showed that nearly half (about 45% of hospitalizations) in 2014 took place on internal disease wards, which may indicate a large bed occupancy of these wards by patients with diagnoses classified as metabolic diseases.

3.2.2 Diseases of the eye and adnexa

Cataracts

Reported hospitalisation distribution per 100,000 adults according to the place of service was not even among voivodeships. The highest value of this ratio was found in Kujawsko-Pomorskie (927.1),

Zachodniopomorskie (875.7), Dolnośląskie (832.1) Voivodeships and the lowest in Warmińsko-Mazurskie (473.1), Małopolskie (550.5), and Świętokrzyskie (550.6) Voivodeships.

Reported hospitalisation distribution per 100,000 children according to the place of service was also not even among voivodeships. The highest value of this ratio was found in Dolnośląskie(6.6), and Śląskie (6.9) Voivodeships and the lowest in Podkarpackie (1.0), Lubuskie (1.1), and Kujawsko-Pomorskie (1.3) Voivodeships. At the same time, taking into account the number of patients and the complex nature of cataract surgery in children, it is recommended to open several highly specialized facilities in Poland.

Diversified migration rates in voivodeships indicate inequalities in providing adequate hospitalization care. The highest percentage of patients from other voivodeships was reported in Lubuskie (15%) and Lubelskie (15.8%) Voivodeships.

There were disproportions in the number of one-day hospitalizations in voivodeships. The highest percentage of one-day hospitalizations occurs in Wielkopolskie (37%), Kujawsko-Pomorskie (34%) and Małopolskie (30%) Voivodeships, and the lowest in the Podlaskie (0%), Zachodniopomorskie (4%) and Śląskie (5%) Voivodeships. According to the information provided by medical experts, international practice indicates that cataract surgery should be performed on a single day, except for cases justified by a particular clinical condition.

There are different values of the percentage of hospitalization with the reported termination of treatment. Perhaps the reason of this phenomenon is the different degree of centralization of care in various regions (service providers terminating the process of cataract treatment did not refer patients for further care in AOS). It should also be noted that healthcare providers could report the end of treatment in various ways.

Percentage of treatment of complicated cataract (reported products from group B18 according to the DRG classification) vs. non-complicated cataract treatment (reported products from group B19 according to the DRG classification) varied among voivodeships. The highest percentage of reported B18 was found in Śląskie (48.7%), Warmińsko-Mazurskie (48.5%) and Świętokrzyskie (45.8%) Voivodeships. The lowest percentage of reported B18 was found in Łódzkie (30.6%), Zachodniopomorskie (28.6%) and Podlaskie (17.3%) Voivodeships.

In the next step, the distribution of the length of stay of patients with complicated cataract should be evaluated. In further steps, the analysis should be extended by information on cataract treatment in the so-called cross-border directive (Directive of 10 October 2014 amending the Directive on Healthcare Services Financed from Public Funds and some other directives).

Glaucoma

Reported hospitalisation distribution per 100,000 adults according to the place of service was not even among voivodeships. The highest value of this ratio was found in Dolnośląskie (67.8), Mazowieckie

(52.6), Lubelskie (43.6) Voivodeships and the lowest in Pomorskie (14.0), Warmińsko-Mazurskie (18.4), and Małopolskie (19.4) Voivodeships.

Reported hospitalisation distribution per 100,000 children according to the place of service was also not even among voivodeships. The highest value of this ratio was found in Podlaskie (119.3), Mazowieckie (70.8), Łódzkie (45.0) Voivodeships and the lowest in Kujawsko-Pomorskie (0.8), Podkarpackie (1.5), and Wielkopolskie (1.5) Voivodeships. At the same time, taking into account the number of patients and the complex nature of glaucoma surgery in children, it is recommended to open several highly specialized facilities in Poland.

There are substantial differences in the percentage of surgical hospitalizations in voivodeships. The highest percentage of surgical hospitalizations occurs in Lubelskie (77.1%), Podkarpackie (73.6%) and Małopolskie (72.4%) Voivodeships, and the lowest in the Świętokrzyskie (50.4%), Podlaskie (33.0%) and Opolskie (22.4%) Voivodeships. In Poland, it was 59.3%.

The percentage of major surgeries among surgical hospitalizations for glaucoma varied among voivodeships. Major surgeries of glaucoma were defined by the performed procedures 12.69 (Other scleral fistulising procedure) and 12.59 (Facilitation of intraocular circulation – other).

In Poland, the most frequently reported Diagnosis-Related Groups within the subgroup of glaucoma diseases is B98, i.e. CONSERVATIVE OPHTHALMOLOGIC TREATMENT (40.7%).

According to the information provided by medical experts, international practice indicates that the percentage of patients treated conservatively for glaucoma should not exceed 10% and that in other countries the number of performed glaucoma treatments is much higher than in Poland.

AMD

As in the case of cataracts and glaucoma, the distribution of reported hospitalizations due to AMD per 100,000 adults versus the place of providing benefits varied among voivodeships. The highest value of this ratio was found in Podlaskie (141.7), Kujawsko-Pomorskie (126.8), Mazowieckie (124.0) Voivodeships and the lowest in Lubelskie (53.9), Opolskie (36.8), and Wielkopolskie (14.9) Voivodeships.

It was observed, that reported hospitalisation distribution per 100,000 children according to the place of service was also not even among voivodeships. The highest value of this ratio was found in Wielkopolskie (1.0), Podlaskie (1.0), and Opolskie (0.6) Voivodeships and the lowest in Zachodniopomorskie (0.3), Lubelskie (0.3), and Pomorskie (0.2) Voivodeships.

The analysis and inference from AMD-related hospitalisation data in 2014 has a small impact on the current needs of patients in Poland due to the medication programme introduced in 2015 regarding the treatment of wet AMD.

In Poland, there are differences in the reporting of B02 – treatment of wet AMD with the use of intravitreal infections of the anti-VEGF monoclonal antibody / recombinant fusion protein according to the DRG classification. In Poland, it was 84.1%.

Strabismus and amblyopia

Reported hospitalisation distribution per 100,000 adults according to the place of service was different among voivodeships. The highest value was recorded in Zachodniopomorskie Voivodeship (21.5), and the lowest in Świętokrzyskie voivodeship (0.7).

Reported hospitalisation distribution per 100,000 children according to the place of service was not even among voivodeships. The highest value of this ratio was found in Zachodniopomorskie (481.1), Podlaskie (283.7), and Pomorskie (282.5) Voivodeships and the lowest in Wielkopolskie (26.5), Lubuskie (20.9), and Opolskie (16.7) Voivodeships.

The percentage of migrations among voivodeships within the strabismus and amblyopia subgroup of diseases vary significantly. Małopolskie, Śląskie, Podlaskie and Świętokrzyskie voivodeships are characterized by high percentages of patient migrations from other voivodeships: 62%, 32%, 29%, 28%, respectively.

Strabismus and amblyopia are problems of the developmental age, and the average age of patients hospitalised for strabismus and amblyopia in Poland was 16.5y.o. This indicates that patients are hospitalised and treated too late. This hypothesis is supported by the fact that the share of hospitalised patients aged 5-8 y.o. for Poland is only 32%. The next step should involve the analysis of the functioning of AOS and primary healthcare services in terms of the early detection of strabismus and amblyopia, including screening examinations.

According to the information provided by medical experts, international practice indicates the need to examine the visual acuity in 4-year-old children, preferably during a paediatric examination.

Disorders of retina and vitreous body excluding AMD

Reported hospitalisation distribution per 100,000 adults according to the place of service was not even among voivodeships. The highest value of this ratio was found in Śląskie (100.8), Lubelskie (94.8), Dolnośląskie (90.6) Voivodeships and the lowest in Lubuskie (50.3), Warmińsko-Mazurskie (30.4), and Świętokrzyskie (18.7) Voivodeships.

Reported hospitalisation distribution per 100,000 children according to the place of service was not even among voivodeships. The highest value of this ratio was found in Podlaskie (173.9), Śląskie (37.5), Dolnośląskie (34.8) Voivodeships and the lowest in Wielkopolskie (5.2), Podkarpackie (3.5), and Lubuskie (1.1) Voivodeships.

Substantial differences in the percentage of surgical hospitalizations occurred among voivodeships. The highest value of this ratio was found in Wielkopolskie (81.0%), Warmińsko-Mazurskie (75.7%) and Łódzkie (74.1%) Voivodeships, while the lowest value was found in Świętokrzyskie (36.9%) and Opolskie (30.8%) and Lubuskie (30%) Voivodeships. At the same time, differences within voivodeships can be observed.

There are large differences in the reporting of the procedures: vitrectomy and vitrectomy with injection of vitreous substitute. The number of reported vitrectomy procedures was highest in Warmińsko-Mazurskie (69.1%), Śląskie (63.4%) and Wielkopolskie (55.1%) Voivodeships (average value for Poland: 44.4%) and lowest in Podlaskie (24.7%), Kujawsko-Pomorskie (24.5%) and Opolskie (19%) Voivodeships. The number of reported vitrectomy with injection of vitreous substitute procedures was highest in Śląskie (48.9%), Wielkopolskie (44.6%) and Pomorskie (35.9%) voivodeships (average value for Poland: 27.7%) and lowest in Podkarpackie (12.3%), Opolskie (6.5%) and Podlaskie (3.8%) Voivodeships. Medical experts have indicated that this situation may be caused by an inconsistent qualification system for urgent vitreoretinal procedures.

Disorders of eyelid, lacrimal system and orbit

Reported hospitalisation distribution per 100,000 adults according to the place of service was not even among voivodeships. The highest value of this ratio was found in Lubelskie (104.0), Wielkopolskie (100.4), Dolnośląskie (71.4) Voivodeships and the lowest in Kujawsko-Pomorskie (37.7), Łódzkie (37.4), and Warmińsko-Mazurskie (18.1) Voivodeships.

Reported hospitalisation distribution per 100,000 children according to the place of service was not even among voivodeships. The highest value of this ratio was found in Kujawsko-Pomorskie (110.9), Podlaskie (110.7), Mazowieckie (106.4) Voivodeships and the lowest in Lubuskie (30.0), Warmińsko-Mazurskie (22.9), and Małopolskie (21.7) Voivodeships.

The percentage of surgical hospitalisations ranges from 0% to 100% among voivodeships. It was highest in Wielkopolskie (95.6%), Pomorskie (94.6%) and Mazowieckie (94.5%) voivodeships and lowest in Warmińsko-Mazurskie (88.6%), Lubelskie (88.4%) and Śląskie (78.3%) voivodeships. In Poland, it was 91.1%.

According to the information provided by medical experts, international practice indicates that major procedures on eyelid, lacrimal system and orbit should be performed as part of hospitalisation and minor ones should be performed in AOS.

Enucleations

In Poland, the percentage of enucleation and evisceration without implant ranged from 40% to 100% among voivodeships. The percentage of enucleations without implants should be minimised for enucleations not related to neoplastic diagnoses. According to the information provided by medical experts, international standards indicate a tendency towards minimising the proportion of enucleations without implants (for enucleations not related to cancer diagnoses).

Disorders of cornea

Reported hospitalisation distribution per 100,000 adults according to the place of service was not even among voivodeships. The highest value of this ratio was found in Śląskie (30.4), Lubelskie (16.3), Mazowieckie (14.4) Voivodeships and the lowest in Opolskie (4.4), Małopolskie (3.6), and Warmińsko-Mazurskie (3.1) Voivodeships.

Reported hospitalisation distribution per 100,000 children according to the place of service was not even among voivodeships. The highest value of this ratio was found in Śląskie (20.1), Podlaskie (6.2), Łódzkie (3.8) Voivodeships and the lowest in Warmińsko-Mazurskie (1.1), Lubuskie (1.1), and Opolskie (0.6) Voivodeships.

Due to the provisions governing permissions to carry out transplantations by the sites in Poland, the distribution of hospitalisations per 100,000 population was diverse, with considerable migrations (mostly to Śląskie and Lubelskie Voivodeships).

In Poland, the share of hospitalisations with penetrating keratoplasty as part of surgical hospitalisation for corneal disorders was 18%, with differences between voivodeships. The percentage was highest in Pomorskie (33.3%) and Śląskie (27.6%) Voivodeships, and the lowest in Kujawsko-Pomorskie (5.1%) and Małopolskie (2.1%) Voivodeships. In six voivodeships, no hospitalisations involving penetrating keratoplasty were reported. The structure of this ratio varies among voivodeships.

In Poland, the share of hospitalisations with limbal stem cell transplantation as part of surgical hospitalisation for corneal disorders was 1.4%, with differences between voivodeships. The percentage was highest in Śląskie (3.2%) and Lubelskie (1.0%) Voivodeships, and the lowest in Mazowieckie (0.8%) and Pomorskie (0.6%) Voivodeships. In eleven voivodeships, no hospitalisations with limbal stem cell transplantation were reported. The structure of this ratio varies among voivodeships.

At the same time, the percentage of lamellar keratoplasty among transplantations is 4.4% in Poland, with differences among voivodeships. The percentage was highest in Mazowieckie (11.4%), Kujawsko-Pomorskie (10.3%) and Lubelskie (10.0%) Voivodeships, and the lowest in Łódzkie (4.5%), Śląskie (2.7%) and Małopolskie (2.1%) Voivodeships. In ten voivodeships, no hospitalisations involving lamellar keratoplasty were reported. The structure of this ratio varies among voivodeships.

According to the information provided by medical experts, international practice indicates that the number of transplantations performed in Poland is limited due to too few cornea donations.

3.2.3 Diseases of the skin

General Conclusions

Inpatient treatment of skin diseases is characterized by disproportions in the number of hospitalisations reported in individual voivodeships. The greatest number of hospitalisations was reported in Mazowieckie Voivodeship (39.76 thousand), whereas the lowest in Lubuskie Voivodeship (4.28 thousand).

Reported hospitalisation distribution per 100,000 inhabitants according to the place of service is not even. The highest value was recorded in Mazowieckie Voivodeship (745). In contrast, the lowest value was recorded in Lubuskie Voivodeship (419). As for hospitalisation rates per 100,000 children, the highest value was recorded in Warmińsko–Mazurskie Voivodeship (968), whereas the lowest in Opolskie Voivodeship (509). The same rate for adults was highest in Mazowieckie Voivodeship (742) and lowest in Lubuskie Voivodeship (376).

Full conclusions regarding the quality of healthcare in the area of skin diseases can be drawn after a full analysis including outpatient care.

Selected infections

Reported hospitalisation distribution per 100,000 inhabitants according to the place of service is not even. The highest value was recorded in Mazowieckie Voivodeship (179). In contrast, the lowest value was recorded in Wielkopolskie Voivodeship (102). As for hospitalisation rates per 100,000 children, the highest value was recorded in Świętokrzyskie (266) Voivodeship, whereas the lowest in Opolskie Voivodeship (73). The same rate for adults was highest in Mazowieckie Voivodeship (179) and lowest in Lubuskie Voivodeship (92).

In Poland, the most frequent DRG from the group of selected infections used to report hospitalisations in the analysed diagnosis group was J46 MAJOR INFECTIOUS SKIN DISEASES, which accounted for 24% of all hospitalizations reported with a DRG. In Poland, the percentage of readmissions to the same hospital within 30 days from the discharge date was 5.5%.

Selected non-malignant neoplasms

Reported hospitalisation distribution per 100,000 inhabitants according to the place of service is not even. The highest value was recorded in Świętokrzyskie voivodeship (208). In contrast, the lowest value

was recorded in Podlaskie Voivodeship (65). As for hospitalisation rates per 100,000 children, the highest value was recorded in Dolnośląskie Voivodeship (164), whereas the lowest in Opolskie Voivodeship (24). The same rate for adults was highest in Świętokrzyskie voivodeship (226) and lowest in Małopolskie Voivodeship (69).

In Poland, the most frequent DRG from the group of selected infections used to report hospitalisations in the analysed diagnosis group was J33 MEDIUM SKIN PROCEDURES, which accounted for 54% of all hospitalizations reported with a DRG. In Poland, the percentage of readmissions to the same hospital within 30 days from the discharge date was 2.4%.

Dermatitis and eczema

Reported hospitalisation distribution per 100,000 inhabitants according to the place of service is not even. The highest value was recorded in Warmińsko-Mazurskie Voivodeship (93). In contrast, the lowest value was recorded in Lubuskie Voivodeship (14). As for hospitalisation rates per 100,000 children, the highest value was recorded in Warmińsko-Mazurskie Voivodeship (283), whereas the lowest in Lubuskie Voivodeship (18). The same rate for adults was highest in Śląskie Voivodeship (65) and lowest in Lubuskie Voivodeship (14).

It is justified to show what percentage of reported hospitalizations reported with a DRG accounted for J38 SEVERE SKIN DISEASES. This percentage was 27%. In Poland, the most frequent DRG from the group of selected infections used to report hospitalisations in the analysed diagnosis group was J39 MAJOR SKIN DISEASES, which accounted for 55%. The percentage of the J38 group reported with a DRG accounted for 18% of all hospitalizations reported with a DRG. In Poland, the percentage of readmissions to the same hospital within 30 days from the discharge date was 3.3%.

Burns, frostbite, decubitus ulcers, ulcers

Reported hospitalisation distribution per 100,000 inhabitants according to the place of service is not even. The highest value was recorded in Świętokrzyskie voivodeship (104). In contrast, the lowest value was recorded in Zachodniopomorskie Voivodeship (59). As for hospitalisation rates per 100,000 children, the highest value was recorded in Świętokrzyskie (102) Voivodeship, whereas the lowest in Lubelskie Voivodeship (40). The same rate for adults was highest in Świętokrzyskie voivodeship (104) and lowest in Wielkopolskie Voivodeship (58).

In Poland, the most frequent DRG from the group of selected infections used to report hospitalisations in the analysed diagnosis group was J37 SKIN ULCERATIONS, which accounted for 58% of all hospitalizations reported with a DRG. In Poland, the percentage of readmissions to the same hospital within 30 days from the discharge date was 6.2%.

Connective tissue disorders and selected systemic

Reported hospitalisation distribution per 100,000 inhabitants according to the place of service is not even. The highest value was recorded in Lubelskie Voivodeship (124). In contrast, the lowest value was recorded in Lubuskie Voivodeship (20). As for hospitalisation rates per 100,000 children, the highest value was recorded in Łódzkie Voivodeship (70), whereas the lowest in Opolskie Voivodeship (7). The same rate for adults was highest in Lubelskie Voivodeship (142) and lowest in Lubuskie Voivodeship (21).

In Kujawsko-Pomorskie Voivodeship, the most frequent DRG from the group of selected infections used to report hospitalisations in the analysed diagnosis group was H96D SYSTEMIC CONNECTIVE TISSUE DISEASES > 3 DAYS, which accounted for 48% of all hospitalizations reported with a DRG. In Poland, the most frequent DRG from the group of selected infections used to report hospitalisations in the analysed diagnosis group was H96C SYSTEMIC CONNECTIVE TISSUE DISEASES, which accounted for 46% of all hospitalizations reported with a DRG. In Poland, the percentage of readmissions to the same hospital within 30 days from the discharge date was 11.7%.

Inflammatory diseases of the skin

Reported hospitalisation distribution per 100,000 inhabitants according to the place of service is not even. The highest value was recorded in Lubelskie Voivodeship (51). In contrast, the lowest value was recorded in Lubuskie Voivodeship (25). As for hospitalisation rates per 100,000 children, the highest value was recorded in Podlaskie (94) Voivodeship, whereas the lowest in Lubuskie Voivodeship (29). The same rate for adults was highest in Lubelskie Voivodeship (42) and lowest in Zachodniopomorskie Voivodeship (21). In Poland, the most frequent DRG from the group of selected infections used to report hospitalisations in the analysed diagnosis group was J39 MAJOR SKIN DISEASES, which accounted for 30% of all hospitalizations reported with a DRG. In Poland, the percentage of readmissions to the same hospital within 30 days from the discharge date was 4.8%.

Psoriasis

Reported hospitalisation distribution per 100,000 inhabitants according to the place of service is not even. The highest value was recorded in Dolnośląskie Voivodeship (52). In contrast, the lowest value was recorded in Małopolskie Voivodeship (30). As for hospitalisation rates per 100,000 children, the highest value was recorded in Łódzkie (15) Voivodeship, whereas the lowest in Lubuskie Voivodeship (1). The same rate for adults was highest in Dolnośląskie Voivodeship (60) and lowest in Małopolskie Voivodeship (35). In Poland, the most frequent DRG from the group of selected infections used to report

hospitalisations in the analysed diagnosis group was J39 MAJOR SKIN DISEASES, which accounted for 75% of all hospitalizations reported with a DRG. In Poland, the percentage of readmissions to the same hospital within 30 days from the discharge date was 3.5%.

Non-melanoma malignant neoplasms of skin, precancerous conditions, *in situ* carcinomas

Reported hospitalisation distribution per 100,000 inhabitants according to the place of service is not even. The highest value was recorded in Dolnośląskie Voivodeship (47). In contrast, the lowest value was recorded in Opolskie Voivodeship (18). As for hospitalisation rates per 100,000 children, the highest value was recorded in Lubelskie (4) Voivodeship, whereas the lowest in Mazowieckie Voivodeship (0). The same rate for adults was highest in Pomorskie Voivodeship (56) and lowest in Opolskie Voivodeship (21). In Poland, the most frequent DRG from the group of selected infections used to report hospitalisations in the analysed diagnosis group was J33 MEDIUM SKIN PROCEDURES, which accounted for 40% of all hospitalizations. In Poland, the percentage of readmissions to the same hospital within 30 days from the discharge date was 3.8%.

Urticaria and angioedema

Reported hospitalisation distribution per 100,000 inhabitants according to the place of service is not even. The highest value was recorded in Świętokrzyskie voivodeship (47). In contrast, the lowest value was recorded in Lubuskie Voivodeship (20). As for hospitalisation rates per 100,000 children, the highest value was recorded in Podlaskie (134) Voivodeship, whereas the lowest in Wielkopolskie Voivodeship (60). The same rate for adults was highest in Świętokrzyskie voivodeship (31) and lowest in Opolskie Voivodeship (7). In Poland, the most frequent DRG from the group of selected infections used to report hospitalisations in the analysed diagnosis group was P20 DISEASES OF THE SKIN, MUSCULOSKELETAL SYSTEM OR CONNECTIVE TISSUE, which accounted for 52% of all hospitalizations reported with a DRG. In Poland, the percentage of readmissions to the same hospital within 30 days from the discharge date was 3.4%.

Congenital malformations of skin

Reported hospitalisation distribution per 100,000 inhabitants according to the place of service is not even. The highest value was recorded in Pomorskie Voivodeship (18). In contrast, the lowest value was recorded in Świętokrzyskie voivodeship (3). As for hospitalisation rates per 100,000 children, the highest

value was recorded in Warmińsko-Mazurskie Voivodeship (59), whereas the lowest in Świętokrzyskie voivodeship (12). The same rate for adults was highest in Pomorskie Voivodeship (11) and lowest in Lubuskie Voivodeship (1). In Poland, the most frequent DRG from the group of selected infections used to report hospitalisations in the analysed diagnosis group was J33 MEDIUM SKIN PROCEDURES, which accounted for 51% of all hospitalizations reported with a DRG. In Poland, the percentage of readmissions to the same hospital within 30 days from the discharge date was 3.2%.

Infections with a predominantly sexual mode of transmission

Reported hospitalisation distribution per 100,000 inhabitants according to the place of service is not even. The highest value was recorded in Łódzkie Voivodeship (5). In contrast, the lowest value was recorded in Podkarpackie Voivodeship (1). As for hospitalisation rates per 100,000 children, the highest value was recorded in Łódzkie (2) Voivodeship, whereas the lowest in Małopolskie Voivodeship (0). The same rate for adults was highest in Łódzkie Voivodeship (6) and lowest in Podkarpackie Voivodeship (1).

In Poland, the most frequent DRG from the group of selected infections used to report hospitalisations in the analysed diagnosis group was S60 NON-VIRAL INFECTIOUS DISEASES, which accounted for 44%. In Poland, the percentage of readmissions to the same hospital within 30 days from the discharge date was 4.4%.

Cutaneous T-cell lymphoma

Reported hospitalisation distribution per 100,000 inhabitants according to the place of service is not even. The highest value was recorded in Dolnośląskie Voivodeship (5). In contrast, the lowest value was recorded in Podlaskie Voivodeship (1). As for hospitalisation rates per 100,000 children, the highest value was recorded in Pomorskie (3) Voivodeship, whereas the lowest in Mazowieckie Voivodeship (0). The same rate for adults was highest in Dolnośląskie Voivodeship (6) and lowest in Podlaskie Voivodeship (1).

Autoimmune bullous disorders

Reported hospitalisation distribution per 100,000 inhabitants according to the place of service is not even. The highest value was recorded in Podlaskie Voivodeship (16). In contrast, the lowest value was recorded in Lubuskie Voivodeship (3). As for hospitalisation rates per 100,000 children, the highest value was recorded in Kujawsko-Pomorskie (6) Voivodeship, whereas the lowest in Warmińsko-

Mazurskie Voivodeship (0). The same rate for adults was highest in Podlaskie Voivodeship (19) and lowest in Lubuskie Voivodeship (3).

3.2.4 Non-neoplastic diseases of male genital organs

Benign hyperplasia of prostate

Benign hyperplasia of prostate is one of the most important problems among diseases of male genital organs (42.15% of all hospitalizations in the analysed diagnosis group in Mazowieckie Voivodeship). The number of hospitalised patients with this diagnosis varies between voivodeships, ranging from 65.48 in Zachodniopolskie Voivodeship to 127.44 in Podkarpackie Voivodeship (per 100,000 population).

The number of hospitalised patients over 65 y.o. was largest in Podkarpackie Voivodeship (584.74/100,000 population) and lowest in Zachodniopomorskie Voivodeship (308.32/100,000 population).

As far as this condition is concerned, surgical hospitalisations are dominant. It accounted for 93.4% of hospitalisations in Poland.

Male infertility

The small number of hospitalizations due to male infertility across the country (112) results from the specificity and the method of treatment of this disease. The available data show that there are 27 facilities treating male infertility as a part of hospital treatment across the country, however, the assessment of the treatment of this disease will be possible after taking into account outpatient treatment.

Redundant prepuce, phimosis and paraphimosis

The number of hospitalisations per 100,000 population due to redundant prepuce, phimosis and paraphimosis ranged from 25.21 in Śląskie Voivodeship to 52.75 in Podkarpackie Voivodeship. The short average length of stay (average for Poland: 1.4 days) and the low median length of stay (1 for Poland) suggest that the major part of hospitalisations could be provided on a one-day basis.

Non-inflammatory diseases of testes

The number of hospitalisations per 100,000 population due to non-inflammatory diseases of testes ranged from 26.11 in Dolnośląskie Voivodeship to 49.81 in Świętokrzyskie voivodeship.

Inflammatory diseases

The number of hospitalisations per 100,000 population due to non-inflammatory diseases of testes ranged from 6.88 in Zachodniopomorskie Voivodeship to 25.73 in Świętokrzyskie voivodeship. Such substantial differences cannot only result from demographic differences; perhaps their cause is the accessibility to the treatment both in the outpatient and inpatient care.

3.2.5 Diseases of the genitourinary system (in females)

The distribution of reported hospitalization in relation to diseases of the genitourinary system in women per 100,000 inhabitants is not even in the country. The ratio was highest in Wielkopolskie (995.34 cases), and the lowest in Lubuskie Voivodeship (608.96 cases). Applications for the functioning of inpatient care can be further discussed in detail after the analysis of outpatient specialist care is performed.

The highest average age in Poland for the diseases of the genitourinary system is recorded in female patients with diseases of sex organs (average age in years: 62).

In Poland, a surprisingly high percentage of hospitalizations can be observed on wards at the third referral level for diseases: disorders of menstruation and abnormal hyperplasia or location of genital mucosa. These values vary across voivodeships. In the case of disorders of menstruation, the minimal value was recorded in Małopolskie Voivodeship (4.9%), and the highest value in Lubuskie Voivodeship (34.6%). For the group 'abnormal hyperplasia or location of genital mucosa', the minimal value recorded in Pomorskie Voivodeship (5.0%) and the highest value in Łódzkie Voivodeship (39.1%).

In Poland, there is an exceptionally high percentage of scheduled admissions for diseases: disorders of menstruation (58.5%) and inflammation of female sex organs (46.8%).

The data indicate the existence of migrations among voivodeships in case of diseases of the genitourinary system (in females). The highest share of hospitalization of patients from outside the voivodeship was observed in Lubuskie Voivodeship (9.6%), and the lowest one in Kujawsko-Pomorskie Voivodeship (4.1%). The analysis of data on the place of origin of patients hospitalized in individual voivodeships showed that patients hospitalized due to diagnoses from the group of disorders of fertility migrate more often to facilities located outside the voivodeship of their residence. The observed differences in the migration of patients among voivodeships due to the disorders of fertility may result from the existence of highly specialised facilities in the country, which perform unique treatments in the

country, or may be caused by the difference in access to outpatient and inpatient treatment among voivodeships.

In case of several analysed groups of diagnoses, the data from the maps of healthcare needs indicate that both of the reported hospital discharges ("end of treatment" and "referral to further treatment") can be freely interpreted and used interchangeably, thus they do not bring any information value.

3.2.6 Diseases of the kidneys and urinary tract

In 2014, in Poland, 358.5 thousand hospitalisations due to the diseases classified as the diseases of the kidneys and urinary tract were recorded, which gives 931.5 hospitalisations per 100,000 people. Of note is the wide variation of this ration in the analysed subgroups.

It should be noted that full inference about the care of patients with diseases of the kidneys and urinary tract will be possible after analysing all forms of treatment, including, in particular, outpatient specialist care.

Renal failure

In case of renal failure, the number of hospitalizations of adults per 100,000 population ranges from 191.77 in Śląskie Voivodeship to 281.33 in the Mazowieckie Voivodeship, while the number of hospitalised children per 100,000 children ranges from 3.71 in Opolskie Voivodeship to 52.46 in the Wielkopolskie Voivodeship. In the case of children, 81% of hospitalisations were reported on paediatric nephrology wards (15 such wards were reported in 11 voivodeships).

It is postulated to deepen the analysis of patients with renal failure, in particular according to acute and chronic cases. A detailed analysis in terms of dialysis should also be performed.

Kidney transplant and complications of kidney transplant

In Poland, in 2014, 1.14 thousand kidney transplants were reported, including 1.09 thousand kidney transplants in adults (in 20 facilities across the country), 26 kidney transplants in children (in 1 facility) and 25 kidney and pancreas transplants (in 4 facilities).

For 95% cases, kidneys from a deceased donor were transplanted. In 70% of all hospitalisations, emergency admission was reported as an admission mode. The percentage of patients hospitalized outside the voivodeship was 70.4%, and the median length of stay was 14 days.

In 2014, 6.21 thousand hospitalisations of adults and 0.19 thousand hospitalisations of children qualified as hospitalisations related complications of kidney transplants were reported³. The percentage of patients hospitalized outside the voivodeships was 32.5% in the case of adults and 63.35% in the case of children.

In further steps, the analysis of transplantation should be deepened, in particular regarding the waiting time for transplantation and the management of patients after transplantation.

Glomerular diseases

In the case of glomerulonephritis, the number of hospitalisations of adults ranges from 18.69 per 100,000 population in Warmińsko-Mazurskie Voivodeship to 59.86 in Dolnośląskie Voivodeship.

However, the number of hospitalised children per 100,000 children ranges from 9.28 in Opolskie Voivodeship to 153.71 in Kujawsko-Pomorskie Voivodeship.

In the case of 8.3% of hospitalisation of adults and 2.7% hospitalisations of children, the kidney biopsy procedure was reported. However, it should be emphasized that due to the low quality of the reporting data resulting from systemic constraints, it is not possible to monitor the actual number of hospitalizations under which a kidney biopsy was performed.

Urolithiasis

Within the analysed subgroup, the number of hospitalizations per 100,000 population varies significantly among voivodeships (from 138 in Dolnośląskie Voivodeship to 391 in Łódzkie Voivodeship in case of adults and from 22 in Opolskie Voivodeship to 149 in Lubuskie Voivodeship in case of children).

In case of adults, 70.8% of hospitalizations were reported with DRG treatment. In case of 41.5% hospitalisations of adults, extracorporeal shockwave lithotripsy (ESWL) was reported, and ureteroscopy (URSL) in case of 15.1%. It is worth noting that 97.5% of hospitalisations of children were reported with conservative DRGs.

The average length of stay (ALOS) within the analysed subgroup, both for children and adults, was about 3 days, while the median length of stay (MLOS) was about 2 days.

3.2.7 Diseases of liver, biliary tract and pancreas (excluding malignant and non-malignant neoplasms)

³hospitalizations for which Z94.0 or T86.1 was reported as the primary diagnosis or Z94.0 was reported as a coexistent diagnosis

In 2014, in Poland, 230.91 thousand hospitalisations due to the diseases of liver, biliary tract and pancreas (excluding malignant and non-malignant neoplasms) were recorded, which gives 600.0 hospitalisations per 100,000 population.

Number of hospitalisations with endoscopic procedure among the analysed diagnosis was 49.01 thousand (127.4 per 100,000 population). The number of hospitalisations in which at least one surgical procedure was reported was 76.60 thousand (199.1 per 100,000 population). The number of hospitalisations with endoscopic procedure among ICD-10 provided by medical experts was 151 thousand (391.22 per 100,000 population), while the number of hospitalisations in which at least one surgical procedure was reported was 85 thousand (221.13 per 100,000 population). However, it should be emphasized that due to the low quality of the reporting data resulting from systemic constraints, it is not possible to monitor the number of hospitalizations under which a liver biopsy was performed.

Although the percentage of hospitalisation with endoscopic procedures in hospitals in Poland amounts on average to approx. 15.4%, there is this parameter varies among hospitals to a large extent. For some healthcare providers reporting more than 100 hospitalizations per year, the maximum percentage of such treatments was almost 99.0%.

In case of a group of diagnoses of diseases of liver, biliary tract and pancreas (including neoplasms) 27.83 thousand reported hospitalisations with endoscopic procedure were identified in Poland. For these diagnoses, the percentage of hospitalisations with endoscopic procedures in Poland was 18.48%. In this group, the percentage of hospitalizations with the simultaneously reported anaesthesia was 21.65%. The lowest value of this variable was recorded in the Lubuskie Voivodeship (1.0%), and the highest in the Śląskie Voivodeship (44.0%).

In addition, hospitalisations with reported surgical procedures were analysed. There were significant differences in this regard among voivodeships. The highest value in Mazowieckie Voivodeship was 11.9 thousand, and the lowest value in Lubuskie Voivodeship amounted to 2.2 thousand.

3.2.8 Diseases of the upper gastrointestinal tract (excluding malignant and non-malignant neoplasms)

In 2014, in Poland, 344.75 thousand hospitalisations due to the diseases of liver, biliary tract and pancreas (excluding malignant and non-malignant neoplasms) were recorded, which gives 900.0 hospitalisations per 100,000 population.

The number of hospitalisations with endoscopic procedure among the analysed group of diagnosis was 128.63 thousand (334.3 per 100,000 population).

The number of hospitalisations with endoscopic procedure among ICD-10 provided by medical experts was 35 thousand (90.54 per 100,000 population), while the number of hospitalisations in which at least one surgical procedure was reported was 23 thousand (58.87 per 100,000 population).

Although the percentage of hospitalisation with endoscopic procedures in hospitals in Poland amounts on average to approx. 23.5%, there is this parameter varies among hospitals to a large extent. For some healthcare providers reporting more than 100 hospitalizations per year, the maximum percentage of such treatments was almost 78.0%.

In case of a group of diagnoses of diseases of the upper gastrointestinal tract (including neoplasms) in Poland, 17.08 thousand reported hospitalisations with endoscopic procedure were identified in Poland. For these diagnoses, the percentage of hospitalisations with endoscopic procedures in Poland was 49.03%. In this group, the percentage of hospitalizations with the simultaneously reported anaesthesia was 20.44%. The lowest value of this variable was recorded in the Lubuskie Voivodeship (3.0%), and the highest in the Śląskie Voivodeship (36.0%).

In addition, hospitalisations with reported surgical procedures were analysed. There were significant differences in this regard among voivodeships. The highest value in Mazowieckie Voivodeship was 3.3 thousand, and the lowest value in Świętokrzyskie voivodeship amounted to 0.4 thousand.

3.2.9 Diseases of the lower gastrointestinal tract (excluding malignant and non-malignant neoplasms)

In 2014, in Poland, 551.2 thousand hospitalisations due to the diseases of the lower gastrointestinal tract (excluding malignant and non-malignant neoplasms) were recorded, which gives approx. 1,432.23 hospitalisations per 100,000 population. Number of hospitalisations with endoscopic procedure was 144 thousand (374.60 per 100,000 population). The number of hospitalisations in which at least one surgical procedure was reported was 203 thousand (527.73 per 100,000 population). However, it should be emphasized that due to the low quality of the reporting data resulting from systemic constraints, it is not possible to monitor the number of hospitalizations under which a procedure called capsule endoscopy (VCE) was performed.

There was a wide variation among voivodeships in terms of the share of hospitalisations with the reported surgical procedure within the group of "non-neoplastic diseases of anus and rectum". The highest value among voivodeships amounted to 75.23%, and the lowest 36.9%, with the value for Poland amounting to 54.53%. These differences are even more significant at the level of individual healthcare providers.

There is also a wide variation between voivodeships in the number of hospitalisations per 100,000 population in terms of diseases requiring urgent surgical operation (from 103.65 in Świętokrzyskie voivodeship to 136.42 in the Podlaskie Voivodeship). In this group of diseases, the lowest post-operative mortality standardized by age and sex within 90 days after discharge characterised the Podlaskie Voivodeship (3.3%). The highest ratio (6.5%) was found in Dolnośląskie and Łódzkie Voivodeships.

In the case of additional diagnoses (including neoplasms) provided by medical experts, the percentage of hospitalisations with endoscopic procedures was 39.31%, and the percentage of hospitalisations in which anaesthesia was reported simultaneously was 26.14%.

It should be noted that, as in case of diseases of the upper gastrointestinal tract and diseases of liver, biliary tract and pancreas, full inference about the care of patients with diseases of the gastrointestinal will be possible after analysing all forms of treatment, including, in particular, outpatient specialist care. In addition, it should be noted that maps of healthcare needs have been created also for diseases of other parts of the gastrointestinal system, neoplasms(malignant and non-malignant) as well as congenital disorders.

3.2.10 Diseases of the nose, nasal sinuses, ear, pharynx and larynx

In 2014, 288.4 thousand hospitalisations due to diagnoses analysed were reported in Poland. There are differences in the number of hospitalizations between the voivodeships. The ratio was highest in Mazowieckie Voivodeship (58.7 thousand), and lowest in Lubuskie Voivodeship (6.2 thousand).

The numbers of hospitalised children and adults in individual voivodeships vary. The highest number of hospitalisations of adults was recorded in Mazowieckie Voivodeship (30.5 thousand), and the lowest in Lubuskie Voivodeship (3.6 thousand). In case of children, the number of hospitalisations in Mazowieckie Voivodeship amounted to 28.3 thousand, and 2.6 thousand in Lubuskie Voivodeship.

The data indicate significant migrations between voivodeships. The highest migration rate was observed in Mazowieckie Voivodeship and the lowest in Małopolskie Voivodeship, with a high migration rates of patients aged 0-17.

3.2.11 Infectious diseases: viral hepatitis

In 2014, the number of hospitalisations due to viral hepatitis in Poland was 19.7 thousand. For the sake of the analysis, a division for the grouped diagnoses according to the ICD-10 classification was performed (chronic viral hepatitis B, chronic viral hepatitis C, acute chronic viral hepatitis, other and unspecified forms of chronic viral hepatitis, unspecified viral hepatitis).

The biggest group of diseases of viral hepatitis in terms of the number of hospitalizations in Poland was chronic viral hepatitis C (12.5 thousand hospitalisations across the country). In terms of infectious diseases of viral hepatitis, there is a significant difference in the number of hospitalizations per 100,000 population in individual voivodeships, from 22.6 hospitalisations per 100,000 population in Wielkopolskie Voivodeship to 104.5 hospitalizations per 100,000 population in Świętokrzyskie voivodeship.

The analysed group of diseases is highly diversified in terms of hospitalisations of patients from outside the voivodeship: from 2.9% in Lubelskie to 33.1% in Zachodniopomorskie Voivodeships. It can be seen that there is a large percentage of patients with chronic hepatitis B or C admitted on an emergency basis.

In Poland, in 2014, a medication programme titled "Treatment of chronic viral hepatitis C" was carried out by 73 healthcare providers, whereas in case of a medication programme titled "Treatment of chronic viral hepatitis B", the number of healthcare providers across the country was 64. The largest concentration of healthcare providers implementing both medication programmes occurred in the southern part of the country.

Since the number of hospitalisations of children and adolescents with chronic viral hepatitis B is small in the country, it can be assumed that the programme of compulsory paediatric vaccinations against viral hepatitis B for children worked well.

3.2.12. Infectious diseases: HIV infection

In the part referring to the inpatient care in case of acquired immunodeficiency syndrome (AIDS) and HIV infection, all inpatient services with diagnoses from categories B20-B24 according to the 10th revision of the International Statistical Classification of Diseases and Related Health Problems (ICD-10) were analysed.

In Poland, 3.6 thousand hospitalisations with the main diagnosis from the range of B20-B24 were reported under contracts with the National Health Fund (NFZ) in 50 hospitals.

Due to the small number of annual hospitalisations, inpatient services provided to patients with AIDS or infected with HIV in Poland are of a centralized and cross-voivodeship character. For this reason, the largest number of hospitalisations was recorded in Mazowieckie Voivodeship (1.3 thousand), while in five voivodeships (Lubelskie, Opolskie, Podkarpackie, Świętokrzyskie and Warmińsko-Mazurskie Voivodeships), there were less than 50 hospitalizations and at the same time less than 2.5 hospitalisations per 100,000 inhabitants. Twelve hospitals in Poland recorded over 100 hospitalisations.

A significant percentage in the structure of patients in the largest hospitals treating patients with AIDS and HIV are patients from other provinces than the one in which the hospital is located. This is the result of the aforementioned centralisation. Men predominate in the structure of patients. In Poland, in 2014, only every fourth person hospitalised due to diagnoses B20-B24 was a woman.

3.2.13 Infectious diseases (excluding hepatitis and HIV infection)

Infectious diseases other than hepatitis and HIV infection

In 2014, 380.86 thousand patients with infectious diseases other than hepatitis and HIV infection were recorded in Poland. The highest hospital morbidity rate occurred in Podlaskie Voivodeship, and the lowest in Śląskie Voivodeship.

The largest number of hospitalisations per 100,000 population occurred in Podlaskie Voivodeship and amounted to 1,556.6 hospitalisations, and the lowest in Lubuskie Voivodeship, and amounted to 838.2 hospitalizations. The largest number of hospitalisations per 100,000 adults occurred in Podlaskie Voivodeship and amounted to 764.9 hospitalisations, and the lowest in Lubuskie Voivodeship, and amounted to 354.8 hospitalizations. The largest number of hospitalisations per 100,000 children occurred in Podlaskie Voivodeship and amounted to 5,248.5 hospitalisations, and the lowest in Śląskie Voivodeship, and amounted to 2,919.5 hospitalizations.

There are significant differences in the number of hospitalisations of children, adults and elderly people (65+) both in absolute as well as relative values among voivodeships within the analysed age subgroups. A low number of hospitalizations of people above 65 years is noticeable in Śląskie, Zachodniopomorskie and Lubuskie Voivodeships.

A high percentage of hospitalisations in terms of infectious diseases was noted within the subgroup of respiratory diseases. The next two most numerous subgroups of infectious diseases are infectious diseases of the gastrointestinal tract and generalised infectious diseases (ambiguously identifiable with a specific system).

The analysis of seasonality of hospitalisations of infectious diseases indicates a high dependence on the season of the year. The highest recorded values corresponding to the number of hospitalisations can be attributed to periodic trends in the incidence of common infectious diseases of the respiratory system and the time after the return from holidays, e.g. spent in exotic holiday destinations. The lowest number of hospitalisations is observed in the second and third quarter.

The basic scope within which hospitalisations of the infectious diseases were carried out was paediatrics, and the paediatric ward was the basic ward in which hospitalisations of the analysed infectious diseases were carried out.

Waiting time and admission type statistics indicate a high degree of diversity between voivodeships. There are significant differences in the manner of reporting of hospitalization from the analysed range of infectious diseases.

Infectious diseases other than hepatitis and HIV infection - Isolation

There are significant differences in the share of hospitalisation of patients with isolated and non-isolated diseases in different healthcare providers.

Differences in the area of share of patients with isolated diagnoses among healthcare providers indicate the necessity of a possible need for a separate analysis of isolated and non-isolated diagnoses in the next edition of Maps of Healthcare Needs.

The number of patients hospitalized in 2014 with an infectious disease from the analysed scope with the characteristics of the isolated disease in Poland amounted to 348.9 thousand patients, the number

of patients hospitalized with an infectious disease in the analysed scope with the characteristics of a non-isolated disease amounted to 31.9 thousand patients.

Infectious diseases other than hepatitis and HIV infection – Infectious diseases of the gastrointestinal tract

Within the analysed sub-group, the number of hospitalisations per 100,000 population was the highest in the Podlaskie Voivodeship and amounted to 374.87 and the lowest in the Lubuskie Voivodeship and amounted to 157.24. The paediatric ward was characterized by the highest number of reported hospitalisations, and the number of reported hospitalisations was characterized by the scope of paediatrics.

The percentage of patients admitted to emergency treatment was 89.6% and in the planned mode was 10.3. It is worth noting that the most frequent products used for the hospitalisation report in the analysed group were P22 INFECTIOUS AND NONINFECTIOUS GASTRITIS AND ENTERITIS. It should be noted that hospitalisations reported as the completion of treatment constituted 54.8% and 43.6% of hospitalisations ended as a referral for further treatment. It is worth noting that the average length of stay (ALOS) as part of the hospitalisation of diagnoses of the analysed subgroup was 4.3 days for Poland, while the median duration of stay was 3.0 days for Poland.

Infectious diseases other than hepatitis and HIV infection – infectious diseases of the respiratory system

Within the analysed sub-group, the number of hospitalisations per 100,000 population was the highest in the Podlaskie Voivodeship and amounted to 814.60 and the lowest in the Śląskie Voivodeship and amounted to 450.28. The paediatric ward was characterized by the highest number of reported hospitalisations, and the number of reported hospitalisations was characterized by the scope of paediatrics. The percentage of patients admitted to emergency treatment was 85% and in the planned mode was 14.8.

It is worth noting that the most frequent products used for the hospitalisation report in the analysed group were P04 DISEASES OF THE LOWER RESPIRATORY TRACT. It should be noted that hospitalisations reported as the completion of treatment constituted 39.0% and 56.5% of hospitalisations ended as a referral for further treatment. It is worth noting that the average length of stay (ALOS) as part of the hospitalisation of diagnoses of the analysed subgroup was 7.1 days for Poland, while the median duration of stay was 6.0 days for Poland. The average death rate for the whole of Poland due to diagnoses in the analysed subgroup was 3%.

3.2.14. Diseases of the oral cavity and dentistry

Treatment of the analysed disease group is provided mainly in outpatient settings. Services performed in a hospital setting are usually surgical procedures or procedures for people requiring anaesthesia (e.g. children, disabled people, requiring special care). In Poland, 10.7 thousand hospitalisations were reported, of which 87% of hospitalisations were surgical hospitalisations. The number of hospitalisations per 100,000 population ranged from 11.05 in Małopolskie Voivodeship to 69.75 in Warmińsko-Mazurskie Voivodeship.

The analysis of the structure of wards, where patients were hospitalized showed that 54% of all hospitalisations were reported in the maxillo-facial surgery ward, while 27% in the otorhinolaryngologic ward.

In the case of 86% of hospitalisation, the admission mode was reported as scheduled mode. In the next analysis step, the analysis should be extended, checking what percentage of patients in the period up to 7 days before admission to the hospital was in the appropriate AOS clinic, which will be an additional measure of the extent to which the admissions of patients were really emergency admissions, and the extent to which they were scheduled admissions. It is also recommended to analyse what percentage of patients appeared in AOS outpatient clinics during 7, 14 and 28 days after hospitalisation.

3.2.15. Injury, poisoning, symptoms, signs, and certain other consequences of external causes.

Data indicate, that despite differences in hospitalisation number due to diagnoses from the group of symptoms according to the ICD-10 classification between hospitals, their share in general hospitalisation number was negligible (ca. 3.3%). The analyses show the difference between the services provided to these patients in terms of the reported procedures. The incidence of these hospitalisations is also different between wards (they were most commonly found in the paediatric cardiology ward).

There are also visible differences in the Injuries and Poisonings group. Number of hospitalisations per 100,000 population is diametrically different, depending on the subgroup being analysed. Similarly, in the case of average length of stay.

It is worth noting that there is an uneven burden of hospital emergency departments (by comparing their number with the number of inhabitants of given voivodeships).

3.3 Therapeutic Rehabilitation

Access to general inpatient rehabilitation for adults varies considerably across the country. The highest number of hospitalisations per 100,000 adults were recorded in Świętokrzyskie voivodeship (787.3), and

the lowest - in Warmińsko-Mazurskie Voivodeship (270.5). The access to systemic rehabilitation for children is also very diversified across the country. The highest number of hospitalisations per 100,000 children were recorded in Warmińsko-Mazurskie Voivodeship (1,095.4), and the lowest - in Opolskie Voivodeship (1.2).

In the case of inpatient cardiac rehabilitation for adults, the largest number of hospitalisations per 100,000 adults were recorded in the Opolskie Voivodeship (273.2), and the lowest in the Mazowieckie Voivodeship (27.7), which indicates a significant diversification of access across the country. The analysis of paediatric inpatient rehabilitation revealed however that only in Śląskie and Dolnośląskie Voivodeships there were medical care facilities providing services relative to paediatric cardiac rehabilitation.

The access to the inpatient neurological rehabilitation is also diversified across the country. The highest number of hospitalisations per 100,000 adults were recorded in Opolskie Voivodeship (157.5), and the in lowest - in the analysed Łódzkie Voivodeship (66.0). However for children the highest number of hospitalisations per 100,000 children were recorded in Warmińsko-Mazurskie Voivodeship (223.4), and the lowest - in Świętokrzyskie voivodeship (0.5). It should be emphasised that in Lubuskie and Łódzkie Voivodeships, there was not a single provider who would provide services within the scope of paediatric neurological rehabilitation.

Access to pulmonary inpatient rehabilitation for adults varies considerably across the country. The highest number of hospitalisations per 100,000 adults were recorded in Opolskie Voivodeship (145.6), and the in lowest - in Lubelskie Voivodeship (1.9). It should be emphasised that in Łódzkie, Podlaskie, Świętokrzyskie and Zachodniopomorskie Voivodeships, there was not a single provider who would provide services within the scope of adult pulmonary rehabilitation. For children the highest number of hospitalisations per 100,000 children were recorded in Lubuskie Voivodeship (378.1), and the lowest - in Małopolskie Voivodeship (0.2). It should be emphasised that in Kujawsko-Pomorskie, Lubelskie, Łódzkie, Mazowieckie, Opolskie, Podkarpackie, Podlaskie, Pomorskie, Świętokrzyskie and Zachodniopomorskie Voivodeships, there was not a single provider who would provide services within the scope of paediatric pulmonary rehabilitation. Attention is drawn to the high percentage of inpatient rehabilitation patients in the scope of systemic, inpatient cardiac and inpatient neurological rehabilitation at the age of 65+ and 80+. The above may indicate the health needs relative to rehabilitation among patients of this age.

3.4 Health Resort Treatment

In 2014, 146 health care providers offered health resort services in 13 voivodeships. The services were used in 45 health resort municipalities, with the largest number 11 of the latter located in Małopolskie Voivodeship. Most services were reported in Zachodniopomorskie Voivodeship (91.20 thousand, 23.04% of all services), while the least in Łódzkie Voivodeship (0.21 thousand).

In Poland, in 2014, 395,90 thousand services were reported for the health resort treatment scope. Health resort healthcare services were most used by patients from the rheumatologic diseases profile (rheumatology) (255,87 thousand patients), while those from the diseases of the eye and eye adnexa profile (ophthalmologic diseases) were used the least. (Table 3.1).

Table 3.1: Structure of health resort healthcare services divided by profile

Profile:	Number patients (in thousands)	including children (in thousands)	Patient share %
rheumatologic diseases (rheumatology)	255.87	0.98	64.63
cardiac diseases and hypertension (cardiology)	52.17	0.07	13.18
diseases of the nervous system (neurology)	28.87	0.13	7.29
diseases of the lower respiratory tract (pulmonology)	18.64	6.40	4.71
diseases of the upper respiratory tract (laryngology)	14.29	6.63	3.61
trauma and orthopaedic diseases (orthopaedics)	7.36	1.66	1.86
diabetes (diabetology)	6.87	0.04	1.74
diseases of the gastrointestinal system (gastroenterology, hepatology)	2.69	0.06	0.68
obesity	2.51	1.80	0.63
endocrine diseases	1.39	0.13	0.35
female diseases (gynaecology)	1.31	-	0.33
diseases of the skin (dermatology)	1.23	0.10	0.31
diseases of the kidneys and urinary tract (nephrology and urology)	1.16	0.02	0.29
peripheral vascular diseases	1.06	0.00	0.27
osteoporosis	0.45	0.00	0.11
diseases of the blood and of the haematopoietic system (haematology)	0.05	0.00	0.01
diseases of the eye and eye adnexa (ophthalmologic diseases)	0.00	-	0.00
IN TOTAL	395.90	18.03	

Source: Compiled by DAiS based on data provided by the NFZ

The patients from Podlaskie Voivodeship used health resort healthcare services most often (1.6 thousand patients per 100,000 population), while those from Zachodniopomorskie were the least likely to use them (0.7 thousand patients per 100,000 population).

The largest number of health resort healthcare services were used in the in-sanatorium service category, by 318.47 thousand patients, while the outpatient service category was the lowest with 15.99 thousand patients.

3.5 Palliative and Hospice Care

Inpatient palliative/hospice care

Distribution of reported patients who were provided with palliative/hospice care for 100,000 population in relation to the place of providing services was not even in relation to voivodeships. The highest rate was identified in Małopolskie Voivodeship (107.8), Świętokrzyskie voivodeship (107.4), Podkarpackie Voivodeship (104.1), and the lowest in Łódzkie Voivodeship (68.8), Mazowieckie Voivodeship (61.9) and Zachodniopomorskie Voivodeship (46.4).

Diversified migration rates in voivodeships indicate inequalities in providing adequate care.

It is also worth paying attention to the diverse profile of healthcare providers in terms of the percentage of patients reported in patients from outside the voivodeship and the share of patients under 18 years of age.

Domestic palliative/hospice care

Distribution of reported patients who were provided with palliative/hospice care for 100,000 population in relation to the place of providing services was not even in relation to voivodeships. The highest rate was identified in the following voivodeships: Kujawsko-Pomorskie (232.0), Lubuskie (202.8), Warmińsko-Mazurskie (184.7), and the lowest in Lubelskie Voivodeship (90.2), Podkarpackie Voivodeship (89.3) and Małopolskie Voivodeship (86.6).

It is also worth paying attention to the diverse profile of healthcare providers in terms of the percentage of patients reported in patients from outside the voivodeship and the share of patients under 18 years of age.

3.6 Long-term Care

Inpatient long-term care

Distribution of reported patients who were provided with long-term care for 100,000 population in relation to the place of providing services was not even in relation to voivodeships. The highest rate was identified in Podkarpackie Voivodeship (198.4), Opolskie Voivodeship (178.3), Małopolskie Voivodeship (155.0), and the lowest in Zachodniopomorskie Voivodeship (108.8), Lubelskie Voivodeship (101.8) and Wielkopolskie Voivodeship (75.3).

It should be noted that also distribution of reported patients who were provided services within the long-term care per 100,000 children in relation to the place of providing services was not even in relation to voivodeships. The highest rate was identified in the following voivodeships: Dolnośląskie (33.6), Śląskie (14.8), Opolskie (14.2), and the lowest in Podkarpackie Voivodeship (2.5), Wielkopolskie Voivodeship (2.2) and Małopolskie Voivodeship (0.9).

Diversified migration rates in voivodeships indicate inequalities in providing adequate care.

There are also noticeable differences in the demographic characteristics of patients to whom the analysed services are provided, as well as their place of origin.

Domestic long-term care

Distribution of reported patients who were provided with long-term care for 100,000 population in relation to the place of providing services was not even in relation to voivodeships. The highest rate was identified in Opolskie Voivodeship (457.0), Śląskie Voivodeship (413.2) Podkarpackie Voivodeship (325.9), and the lowest in Kujawsko-Pomorskie Voivodeship (132.3), Podlaskie Voivodeship (123.9) and Pomorskie Voivodeship (57.2).

It should be noted that also distribution of reported patients who were provided services within the long-term care per 100,000 children in relation to the place of providing services was not even in relation to voivodeships. The highest rate was identified in the following voivodeships: Warmińsko-Mazurskie (17.7), Wielkopolskie (16.0), Podkarpackie (14.0), and the lowest in Zachodniopomorskie Voivodeship (5.0), Lubuskie Voivodeship (3.8) and Lubelskie Voivodeship (3.6).

The diverse profile of healthcare providers, which is easy to note by observing the percentage of patients from outside of the voivodeship, is also worth paying attention to.

3.7 Specialist Outpatient Care

For individual groups of diseases discussed in the maps of healthcare needs, the functioning of specialist outpatient care was analysed. In the first step of the analysis, each disease group was analysed according to the types of clinics defined on the basis of the 8th element of the Ministry of Health in which the patients with the analysed diagnosis group according to ICD-10 appeared. Table 3.2 shows the clinics in which 80% of consultations for specific disease groups was carried out.

Table 3.2: Clinics in which 80% of consultations for specific diagnosis groups was carried out

Disease group	Clinics
Diseases of the musculoskeletal system	Trauma and orthopaedic surgery, rheumatology, neurology, general surgery
Diseases of the nervous system (diseases of the nervous system in the elderly)	Neurology

Disease group	Clinics
Diseases of the nervous system (other than those in the elderly)	Neurology, trauma and orthopaedic surgery, pain management
Diseases of the aorta and peripheral vessels	General surgery, vascular surgery, vascular, dermatology
Hypertension	Cardiology
Diseases of the respiratory system (chronic)	Tuberculosis and pulmonary, allergology, pulmonary
Diseases of the respiratory system (acute)	Tuberculosis and pulmonary, pulmonary, paediatric tuberculosis and pulmonary, allergology
Endocrine diseases	Endocrinology, paediatric endocrinology
Mental disorders – adults	Mental health, alcohol addiction and co-addiction treatment, addiction treatment
Mental disorders – children	Logopedics, paediatric mental health, autism treatment
Pregnancy, childbirth and the puerperium, and neonatal care	Obstetrics and gynaecology
Diabetes mellitus	Diabetes
Neoplasms of haematopoietic or lymphoid tissue	Haematology, oncology, chemotherapy
Diseases of blood and immune system	Haematology, paediatric haematology, immunology
Non-malignant neoplasms	General surgery, endocrinology, dermatology, surgical oncology, obstetrics and gynaecology, oncology
Congenital defects	General surgery, hip dysplasia, paediatric general surgery, trauma and orthopaedic surgery, paediatric trauma and orthopaedic surgery, dermatology
Metabolic disorders	Rheumatology, osteoporosis, metabolic diseases, trauma and orthopaedic surgery, general surgery, endocrine osteoporosis
Fractures over the age of 50 years	Trauma and orthopaedic surgery, general surgery
Diseases of the eye and adnexa	Ophthalmology
Diseases of the skin	Dermatology, general surgery
Non-neoplastic diseases of male genital organs	Urology
Diseases of female genitourinary tract	Obstetrics and gynaecology
Diseases of kidneys and urinary tract	Cardiology, urology, nephrology
Diseases of liver, biliary tract and pancreas (excluding malignant and non-malignant neoplasms)	General surgery, gastroenterology, Hepatology
Diseases of the upper gastrointestinal tract (excluding malignant and non-malignant neoplasms)	Gastroenterology, endoscopy laboratory, general surgery, paediatric gastroenterology
Diseases of the lower gastrointestinal tract (excluding malignant and non-malignant neoplasms)	General surgery, gastroenterology, anus and rectum, endoscopy laboratory, paediatric general surgery
Diseases of the nose, nasal sinuses, ear, pharynx and larynx	Otorhinolaryngology, allergology
Infectious diseases: viral hepatitis	Infectious diseases, hepatology
Infectious diseases: HIV	Preventive and therapeutic treatment (HIV/AIDS)
Infectious diseases (excluding hepatitis and HIV infection)	Dermatology, otorhinolaryngology, general surgery, infectious diseases, tuberculosis and pulmonary
Diseases of the oral cavity and dentistry	Dental
Symptoms	Logopedics, otorhinolaryngology, neurology, general surgery, paediatric cardiology, tuberculosis and pulmonary, paediatric neurology, computed tomography laboratory, cardiology, pulmonary, urology, endoscopy laboratory, pain management

Disease group	Clinics
Traumas	Trauma and orthopaedic surgery, general surgery
Poisoning and certain other consequences of external causes	Trauma and orthopaedic surgery, general surgery, neurology

Compiled by DAiS based on data provided by the NFZ and the Central Statistical Office

Table 3.3 presents a comparison of the number of consultations reported through ZD–3 reports and the number of consultations reported to the NFZ. It should be emphasised that figures in the table corresponds to the minimum estimated percentage of consultations provided outside the NFZ. The ZD–3 report is obligatory for entities that provide outpatient care services: both public and non-public healthcare centres as well as medical practices financed from public funds. Where the number of consultations reported through ZD–3 reports was lower than the number of consultations reported to the NFZ, it was assumed that the difference was 0.

Table 3.3: Comparison of numbers of NFZ and ZD–3 consultations

ZD–3 clinic name	NFZ clinic name	% of consultations outside NFZ for PL
Internal diseases clinic	internal diseases, metabolic diseases, paediatric metabolic diseases	96.2
Allergology	Allergology, paediatric allergology	14.1
Diabetes	Diabetes, paediatric diabetes	5.8
Endocrinology	Endocrinology, paediatric endocrinology, endocrinology and gynaecology	22.5
Cardiology	Cardiology, paediatric cardiology, heart defects, hypertension, vascular diseases	15.7
Nephrology	Nephrology, paediatric nephrology	13.1
Dermatology	Dermatology, paediatric dermatology, venereology	14.5
Neurology	Neurology, paediatric neurology, pain management, paediatric pain management, epilepsy, multiple sclerosis	14.5
Oncology	Oncology, paediatric oncology, chemotherapy, radiotherapy, paediatric haematology and oncology, nuclear medicine	14.1
Tuberculosis and pulmonary diseases	Tuberculosis and pulmonary diseases, paediatric tuberculosis and pulmonary diseases, pulmonary diseases, paediatric pulmonary diseases, cystic fibrosis treatment, paediatric cystic fibrosis treatment	6.1
Rheumatology	Rheumatology, paediatric rheumatology	9.2
Infectious diseases	infectious diseases, paediatric infectious diseases, prophylactic and therapeutic (HIV/AIDS), hepatitis, tropical diseases, zoonoses and parasitic diseases, paediatric zoonoses and parasitic diseases	15.4
Obstetrics and gynaecology	Obstetrics and gynaecology, gynaecology, gynaecology for adolescent patients, pregnancy disorders, breast care, gynaecological oncology, family planning and reproductive health	21.2
Surgery - other than trauma and orthopaedic and Neurosurgery clinic	general surgery, paediatric general surgery, anus and rectum, thoracic surgery, vascular surgery, oncology surgery, paediatric oncology surgery, plastic surgery, paediatric plastic surgery, burns, cardiosurgery, paediatric cardiosurgery, pacemaker and ICD monitoring, paediatric pacemaker and ICD monitoring, maxillofacial surgery, paediatric maxillofacial surgery	7.5
Trauma and orthopaedic surgery	Trauma and orthopaedic surgery, paediatric trauma and orthopaedic surgery	17.6
Neurosurgery	Neurosurgery, paediatric neurosurgery	21.7

ZD-3 clinic name	NFZ clinic name	% of consultations outside NFZ for PL
Ophthalmology	Ophthalmology, paediatric ophthalmology, glaucoma treatment, strabismus treatment, paediatric strabismus treatment	23.3
Otolaryngology	Otorhinolaryngology, paediatric otorhinolaryngology, audiology, paediatric audiology, phoniatrics, paediatric phoniatrics, logopedics, paediatric logopedics	11.6
Urology	Urology, paediatric urology	14.1
Dental	Dental, dental	100.0
Dental	Dental, dental	37.1
Periodontology	Periodontology, periodontology	100.0
Periodontology	Periodontology, periodontology	84.1
Orthodontic	Orthodontic, orthodontic	100.0
Orthodontic	Orthodontic, orthodontic	37.3
Dental prosthetics	Dental prosthetics, dental prosthetics	100.0
Dental prosthetics	Dental prosthetics, dental prosthetics	78.7
Dental surgery	Dental surgery, dental surgery	99.9
Dental surgery	Dental surgery, dental surgery	51.7

Compiled by DAiS based on data provided by the NFZ and the Central Statistical Office

Based on the information presented in Table 3.2, we have identified clinics directly and indirectly dedicated to particular disease groups. The analysis distinguished clinics dedicated directly to the analysed diagnosis groups. A detailed analysis for each clinic type is presented in the Maps of Healthcare Needs. Table 3.4 presents a summary of information for clinics dedicated directly to the disease groups in question in the voivodeship.

Table 3.4: Statistics on specialist clinics in Poland

Clinic	number of clinics	number of consultations (in thousands)	number of consultations per clinic in voivodeship (in thousands)	% of W11 consultations for preventive health consultations	% of consultations for patients who appeared at least 3 times
Dental	8040	17,980.35	2.2	-	69.1
Obstetrics and gynaecology	2621	9,870.84	3.8	42.4	70.5
Ophthalmology	1799	8,183.23	4.5	27.3	49.1
Otorhinolaryngology	1617	5,131.92	3.2	50.6	47.5
Neurology	1577	5,393.97	3.4	69.6	56.0
Dermatology	1345	6,003.54	4.5	60.0	53.1

Clinic	number of clinics	number of consultations (in thousands)	number of consultations per clinic in voivodeship (in thousands)	% of W11 consultations for preventive health consultations	% of consultations for patients who appeared at least 3 times
General surgery	1279	7,486.43	5.9	65.1	66.7
Cardiology	1137	4,793.49	4.2	10.6	60.1
Mental health	1038	5,072.71	4.9	-	88.8
Trauma and orthopaedic surgery	982	7,096.25	7.2	56.5	62.6
Urology	819	2,626.50	3.2	45.4	57.0
Diabetes	749	2,265.19	3.0	53.7	73.5
Rheumatology	716	1,853.34	2.6	57.0	70.3
Logopedics	693	1,306.78	1.9	-	97.1
Paediatric dental	674	815.77	1.2	-	70.2
Allergology	655	2,433.43	3.7	60.2	76.8
Orthodontic	619	1,373.10	2.2	-	82.2
Endocrinology	608	2,276.96	3.7	33.4	45.0
Dental prosthetics	464	236.13	0.5	-	41.0
Computed tomography laboratory	433	1,027.88	2.4	100.0	6.8
Dental surgery	420	748.56	1.8	-	45.5
Tuberculosis and pulmonary diseases	413	1,680.72	4.1	45.0	60.9
Gastroenterology	367	839.78	2.3	63.6	48.2
Oncology	352	1,713.08	4.9	50.4	62.8
Pulmonary diseases	333	815.81	2.4	46.2	60.3
Alcohol addiction and co-addiction treatment	321	1,365.68	4.3	-	94.9
Addiction treatment	257	1,033.91	4.0	-	95.7
Nephrology	253	421.45	1.7	26.1	59.2
Paediatric general surgery	211	1,070.03	5.1	60.2	55.0
Paediatric Neurology	204	480.16	2.4	57.6	48.4
Paediatric allergology	197	742.41	3.8	62.3	75.3
Gynaecology	195	544.84	2.8	49.8	65.1
Pain management	185	559.37	3.0	83.9	92.5
Surgical oncology	168	734.27	4.4	60.1	61.7
Psychology	164	165.68	1.0	-	87.5
Paediatric mental health	163	448.22	2.7	-	85.7
Paediatric ophthalmology	160	436.47	2.7	36.3	36.2
Anus and rectum	128	166.22	1.3	62.1	52.6
Paediatric otorhinolaryngology	120	314.20	2.6	42.9	49.8
Paediatric cardiology	119	329.79	2.8	4.0	26.7
Vascular surgery	115	364.34	3.2	53.8	37.2
Vascular clinic	111	257.99	2.3	38.8	33.3
Infectious diseases	111	374.39	3.4	44.6	46.1
Haematology	104	471.03	4.5	32.0	70.2
Paediatric trauma and orthopaedic surgery	101	338.23	3.3	45.6	39.7
Neurosurgery	98	281.82	2.9	72.0	29.0
Audiology	95	228.91	2.4	21.7	37.1
Psychoactive drug addiction treatment	94	283.72	3.0	-	95.1
Metabolic diseases	84	114.04	1.4	43.6	58.0
Paediatric tuberculosis and pulmonary diseases	70	208.61	3.0	59.0	77.4
Breast care	70	183.10	2.6	38.6	35.6

Clinic	number of clinics	number of consultations (in thousands)	number of consultations per clinic in voivodeship (in thousands)	% of W11 consultations for preventive health consultations	% of consultations for patients who appeared at least 3 times
Paediatric neurology	65	137.14	2.1	48.0	55.3
Strabismus treatment	64	213.36	3.3	44.1	76.0
Osteoporosis	63	181.19	2.9	32.2	32.1
Hepatology	54	140.65	2.6	37.0	46.0
Gynaecology for adolescent patients	54	53.07	1.0	34.8	51.7
Paediatric endocrinology	52	165.05	3.2	41.7	47.7
Phoniatrics	49	83.02	1.7	21.8	39.0
Maxillofacial surgery	49	166.38	3.4	71.6	60.3
Paediatric gastroenterology	43	96.53	2.2	60.9	41.5
Genetics	37	79.48	2.1	67.8	17.9
Periodontology	37	86.16	2.3	-	56.2
Paediatric orthodontic	36	77.44	2.2	-	81.1
Paediatric pulmonary diseases	34	75.19	2.2	60.3	73.5
Neurosis treatment	34	82.89	2.4	-	84.3
Paediatric diabetes	32	55.09	1.7	73.9	84.9
Paediatric logopedics	30	67.00	2.2	-	94.3
Autism treatment	30	9.50	0.3	-	97.4
Paediatric rheumatology	29	33.47	1.2	52.5	54.1
Pregnancy disorders	28	51.25	1.8	27.8	68.6
Thoracic surgery	28	83.84	3.0	56.6	47.4
Transplant	27	71.47	2.6	31.7	88.3
Plastic surgery	23	69.48	3.0	58.0	56.9
Paediatric infectious diseases	22	38.44	1.7	49.2	48.4
Paediatric urology	22	49.29	2.2	42.1	41.3
Paediatric haematology	18	33.70	1.9	41.1	47.5
Endocrinology and gynaecology	17	50.80	3.0	54.6	52.8
Paediatric dermatology	16	54.30	3.4	60.0	44.4
Thyroid gland diseases	15	34.11	2.3	32.9	35.2
Arterial hypertension	14	34.80	2.5	30.5	55.2
Preventive and therapeutic treatment (HIV/AIDS)	14	65.25	4.7	52.9	93.2
Paediatric oncology and haematology	12	39.90	3.3	43.8	60.3
Gynaecologic oncology	12	58.88	4.9	49.7	52.9
Sexology and sexual dysfunctions	12	16.06	1.3	-	89.1
Conservative dentistry	11	39.63	3.6	-	63.7
Infertility treatment	9	12.67	1.4	29.2	73.7
Endocrine osteoporosis	9	26.35	2.9	27.6	27.2
Paediatric audiology	9	19.21	2.1	11.5	32.1
Paediatric alcohol addiction and co-addiction treatment	8	4.42	0.6	-	89.1
Paediatric psychology	8	11.81	1.5	-	86.2
Paediatric metabolic diseases	7	8.15	1.2	53.2	46.5
Paediatric oncology	7	13.59	1.9	44.9	62.2
Paediatric neurosurgery	7	15.54	2.2	69.3	24.2
Paediatric phoniatrics	7	8.96	1.3	10.9	52.6
Psychogeriatric	7	25.18	3.6	-	74.7
Paediatric cystic fibrosis treatment	6	3.40	0.6	30.1	75.6

Clinic	number of clinics	number of consultations (in thousands)	number of consultations per clinic in voivodeship (in thousands)	% of W11 consultations for preventive health consultations	% of consultations for patients who appeared at least 3 times
Paediatric surgical oncology	6	15.44	2.6	57.6	42.8
Glaucoma treatment	6	21.20	3.5	19.7	63.2
Paediatric genetics	5	3.38	0.7	72.9	11.2
Paediatric neurosis treatment	5	32.06	6.4	-	99.0
Anti-smoking	5	2.34	0.5	-	88.1
Cystic fibrosis treatment	4	1.85	0.5	43.9	71.7
Zoonoses and parasitic diseases	4	16.51	4.1	45.0	41.4
Paediatric strabismus treatment	4	11.81	3.0	35.6	77.5
Andrology	3	8.29	2.8	62.5	74.7
Paediatric hepatology	3	6.76	2.3	28.2	86.1
Venereology	3	30.47	10.2	76.3	54.8
Paediatric transplant	3	0.47	0.2	47.0	80.9
Paediatric psychoactive drug addiction treatment	3	1.19	0.4	-	93.9
Paediatric pain management	2	5.07	2.5	80.4	99.4
Mental health for children, adolescents and their families	2	6.24	3.1	-	83.7
Psychosomatic	2	4.68	2.3	-	86.3
Paediatric anti-smoking	2	1.24	0.6	-	88.7
Dental for risk group	2	1.91	1.0	-	78.0
HIV					
Hepatitis	1	1.03	1.0	3.2	21.5
Tropical diseases	1	0.04	0.0	97.6	23.8
Paediatric zoonoses and parasitic diseases	1	1.65	1.7	62.7	42.7
Paediatric periodontology	1	0.24	0.2	-	3.8

Compiled by DAiS based on data provided by the NFZ

3.8 Primary Care

1. The current reporting procedures make it impossible to carry out an in-depth analysis of the functioning of primary healthcare. In particular, it is impossible to determine the number of patients with chronic conditions (as only 1 reason for the visit is reported) or their treatment pathways (no information on the tests performed is available).
2. Primary healthcare facilities provide not only treatment-related services. Services provided by the primary healthcare facilities analysed in the document:

- Doctor

5.01.00.0000077 5.01.00.0000078	services provided to patients without diabetes and/or cardiovascular diseases diagnosed
5.01.00.0000075 5.01.00.0000076	services provided to patients diagnosed with diabetes and/or cardiovascular diseases
5.01.00.0000104	health review
5.01.00.0000046 5.01.00.0000047	services provided to non-primary care patients
5.01.00.0000079	
5.01.00.0000102 5.01.00.0000103	postnatal consultation

- Nurse

5.01.00.0000054	tuberculosis prevention consultation
5.01.00.0000107	postnatal consultation
5.01.00.0000052 5.01.00.0000053 5.01.00.0000080	services provided to non-primary care patients

- Midwife

5.01.00.0000089	postnatal visits
5.01.00.0000111 5.01.00.0000110	prenatal education visits
5.01.00.0000091	postoperative care visits
5.01.00.0000055 5.01.00.0000056 5.01.00.0000081	services provided to non-primary care patients

- Night and holiday healthcare services

5.01.00.0000108	outpatient services
5.01.00.0000109	outbound services
5.21.00.0000020	services for patients from the EU

Therefore, patients do not report to outpatient healthcare facilities only to treat health problems, but also to take out preventive measures (vaccinations, health reviews, etc.), for health evaluation or for other administrative purposes.

3. The largest number of outpatient healthcare services were provided by doctors (they constitute 94.8% of all services). Night and holiday healthcare services ranked the second (3.5%), midwives' services accounted for 1.5% of all services and nurses' services - for 0.21%. Due to the lack of individual reporting of primary care nurse services within the full range of provided services (in 2014, 71,126 thousand services were reported in aggregate form and 326 thousand were reported individually), it is not possible to draw the appropriate conclusions from the analysed data.

4. The largest number of facilities reporting physician services per 100,000 population is located in the following voivodeships: Podlaskie, Lubelskie, Warmińsko-Mazurskie and Lubuskie (over 20/100,000 population), and the lowest in the following voivodeships: Pomorskie, Mazowieckie and Małopolskie (below 15/100,000 population).
5. The analysed data shows that throughout the analysed year the patients included in active lists visited most frequently the facilities reporting primary care services in Łódzkie Voivodeship (4.40) and Podlaskie Voivodeship (4.30), and least frequently - facilities in Mazowieckie Voivodeship (3.59) and Małopolskie Voivodeship (3.66).
6. Based on the data, it can be stated that the largest number of consultations in voivodeships was provided to people aged 65+ (45,702 thousand) and 45-64 (4,412 thousand).
7. There are significant differences in the use of night and holiday healthcare services by residents of individual voivodeships. The highest number of services were reported in Pomorskie Voivodeship (18.3 thousand/100,000 people), and the lowest in Dolnośląskie Voivodeship (9.3 thousand/100,000 people). This may indicate that the access to night and holiday healthcare services is different in different counties, or that different facilities are more or less effective in providing healthcare services (including access to specialised outpatient care, not only primary care).
8. In the next step, it would be reasonable to create a tool for primary care facilities that would show how many patients and for what reasons referred to a higher level facility (AOS, hospital) in order to strengthen the coordination of treatment in the case of these patients.
9. Active patient lists were analysed for utilisation of services provided at hospital emergency departments, ERs as well as night and holiday healthcare services. This rate is referred to as the emergency medical care utilisation rate (EMCUR).

In order to calculate the rate, the services provided upon the admission to an emergency department, ER or after-hours medical centre which resulted in the need to provide the patient with a service at a higher level (hospitalisation) service within 2 days from the date of the visit were excluded. Such a restricted number of services was used to calculate rates per 100 patients registered with primary care providers (as of June 2014) at voivodeship, county and country levels.

The highest rate values were observed in Pomorskie (35.5), Zachodniopomorskie (33.4), Śląskie (31.9) and Opolskie (31.2) voivodeships. The voivodeships with the lowest rate values were Lubuskie (23.5), Dolnośląskie (24.2), Warmińsko-Mazurskie (24.7), Wielkopolskie (26.0). The emergency medical care utilisation rate for the entire country was 29.5 per 100 patients registered on active lists.

The differences in the emergency medical care utilisation rate values are largely influenced by access to emergency departments, ERs and night and holiday healthcare facilities. A significant number of such facilities in a region will have a positive effect on the rate (as can be seen e.g. in the case of large cities).

In addition, the analysis shows that, ceteris paribus, a larger number of registered primary care facilities is positively correlated with a higher EMCUR rate (in primary care facilities with a large number of registered patients, a patient more often uses emergency medical care).

3.9 Medical Staff

Analyses concerning human resources are the same as those published on 30 April 2016 in the so-called hospital maps. Due to the size of this document, content already published before will not be repeated here. For more details, see the respective elements of hospital maps.

3.10 Equipment Resources

Analyses concerning equipment resources are the same as those published on 30 April 2016 in the so-called hospital maps. Due to the size of this document, content already published before will not be repeated here. For more details, see the respective elements of hospital map.



CATCHING GAPS WITH
HEALTHCARE MAPS



Part IV

Forecast

4.1 Population Status and Breakdown Forecast

Demographic forecasts for the analysed period are the same as those published on 30 April 2016 in the so-called maps of healthcare needs - hospitals. Due to the size of this document, content already published before will not be repeated here. For more details, see the respective elements of hospital map.

4.2 Forecast of incidence

In the voivodeship maps of healthcare needs dedicated to particular groups of diseases, the results of projected recorded incidence for the years 2020-2029 were presented. According to the explanation presented in chapter **Estimating epidemiological indicators**, it should be remembered that the forecasting process is subject to uncertainty. For this reason, the detailed forecast results presented in individual maps are presented in four scenarios. ("Minimal", "maximal", "personalised" and "averaged").

- The “minimal” demographic variant: with regard to the correlation between the valuation of services and the disease entity, and hence the incidence of “upcoding”, overdiagnosis of this disease entity can be observed. Due to the fact that the degree of upcoding cannot be verified based on the available data, it is assumed that the phenomena is the most advanced in the voivodeship with the highest recorded incidence. Accordingly, adoption of the lowest recorded incidence rate in the voivodeship as the reference value for the remaining voivodeships is well founded.
- The “maximal” demographic variant: with regard to the correlation between the accessibility to the healthcare system in certain regions diseases are detected less often and later. Due to the fact that the degree of diseases' detectability cannot be clearly verified based on the available data, it is assumed that the phenomena is the most advanced in the voivodeship with the highest recorded incidence. Accordingly, adoption of the highest recorded incidence rate in the voivodeship as the reference value for the remaining voivodeships is well founded.
- The “personalised” demographic variant: there are factors differentiating the recorded incidence rate between certain diseases among voivodeships. It is assumed that the observed differences between recorded incidence rates will not disappear over time (the factors that cause differences are continued and they will occur in the future). Therefore, adopting the observed rate for each voivodeship is well founded.
- The “averaged” demographic variant: there are differences between voivodeships which will be equal after long period of time, and the causes of the observed differences in the historical data wer

- only transitional (there will be a convergence in the country because the differences are not resulting from systematic differences in the real risk between the voivodeships). Therefore, it is assumed that the recorded incidence rates for all voivodeships are equal.
- Utilisation of the aforementioned reasoning enables the forecast volatility estimates for the observed demographic trend. Adoption of different variants of forecast stems from lack of the sufficient knowledge about current values of epidemiological indicators and uncertainty about the value of the future recorded incidence rate. Nonetheless, using the aforementioned methodology, there is a possibility to estimate the ranges of forecast values. Due to the volume of the document, it was decided not to repeat the content contained in the detailed maps, so for more details their respective elements.

4.3 Projected Number of Beds

The projected number of beds was discussed in the hospital maps of healthcare needs published on 30 April 2016. Due to the size of this document, content already published before will not be repeated here. For more details, see the respective elements of hospital maps. The next forecast of the number of beds will be prepared for the next edition of hospital maps to be published in May 2018.

4.4 Forecasts for selected disease groups

In the maps of healthcare needs in the scope of selected groups of diseases, the results of prognostic models specific only for a given group were additionally presented.

- In the groups of diseases in which palliative and hospice care was analysed, the results of the model predicting the demand for palliative and hospice places were presented.

The total demand in hospice/palliative care was estimated at 105.8 thousand, of which 3.8 thousand are inpatient places.

- The results of the prognostic allocation model for paediatric wards are presented in the map of healthcare needs in the scope of paediatric diseases in the chapter 'Forecast of services and healthcare providers'.

The obtained results indicate that in the years 2014-2020 we will observe the decrease in the number of general paediatric hospitalisations of approx. 31 thousand, and the number of hospitals reporting at least 700 such hospitalisations will decrease from 283 to 267.

- In the map of healthcare needs in the scope of pregnancy, childbirth and puerperium, and neonatal care in the chapter 'Forecast of demand for maternity wards', a similar prognostic model was presented referring to the allocation of maternity wards.

In accordance with the results of the model, in 2020, among healthcare providers currently functioning in Poland, 301 show the potential for carrying out at least 400 deliveries, or are necessary from the point of view of the quick access to primary care midwife services (with the exception from the applied rule of 400 deliveries constituted by maternity sites which were the only ones providing services within the radius of 40 km). In all other cases, the need for retaining a maternity-related ward should be reconsidered.

- However, in the map of healthcare needs in the scope of haematopoietic and lymphoid tissue neoplasms, the prognosis results of paediatric haematooncology facilities have been presented.