

Analysis of psychiatric services for patients diagnosed with schizophrenia, reported to the National Health Fund in the years 2009–2018

Marta Anczewska¹, Marek Balicki², Amelia Drożdżikowska³,
Piotr Gorczyca⁴, Jolanta Janus³, Sylwia Paciorek³, Robert Plisko⁵,
Mariusz Zięba³

¹ Institute of Psychiatry and Neurology, Warsaw

² Office for the National Mental Health Protection Pilot Programme, Warsaw

³ Analysis and Strategy Department of the Ministry of Health, Warsaw

⁴ Medical University of Silesia, Katowice

⁵ HTA Consulting, Krakow

Summary

Aim. Analysis of psychiatric services for patients diagnosed with schizophrenia, reported to the National Health Fund in the years 2009–2018.

Method. Schizophrenia is analyzed as one of the diseases with the highest rate of Disability-Adjusted Life Years – DALY. In the study, the unitary data of the National Health Fund (NFZ) was used, reported in the years 2009–2018. Patients were identified by the Personal Identity Number (PESEL). The services for adults were analyzed, i.e., people who were at least 18 years old in the year when the services were discontinued, for whom the main disease was schizophrenia classified by ICD-10 codes: F20 to F20.9. Provided services were analyzed according to those specified in the ordinance of the President of the National Health Fund of June 28, 2019 – organizational units and billing product codes.

Results. Between 2009 and 2018, the number of patients diagnosed with schizophrenia treated in the public sector increased by 5%. In the analyzed years, the number of in-patients decreased by 9%, while the number of people using out-patient services and community treatment increased by 6%. In forensic psychiatry departments, a very high increase (by 212%) in the number of hospitalized patients was observed. In 2018, the average number of hospitalization days in a general psychiatric ward was 43, in the forensic ward 279. A very low percentage of patients (less than 3%) used day therapy. In out-patient treatment, the mainstay of therapy was a medical consultation; less than 10% of patients used other types of services. In 2018, an average of four visits/consultations per patient was reported. There has been a very high decrease in the number of patients (by 77%) using group therapy, family therapy and support.

Conclusions. In 2009–2018, most patients diagnosed with schizophrenia in the public sector were treated using the traditional model of care: medical consultation and psychiatric hospitalization. It is advisable to reorganize the system – implementation and development of comprehensive care coordinated within the community care model. Extending the study with information from the non-public sector would give a full picture of system functioning and facilitate service needs estimation for this group of patients.

Key words: psychiatric services, schizophrenia, maps of health needs

Introduction

Schizophrenia is a chronic, multidimensional mental disorder that has not been fully understood despite many years of extensive research. Some authors assume that schizophrenia should be considered in terms of a continuum of neurodevelopmental disorders in which negative symptoms and cognitive deficits constitute an essential element of psychosis [1, 2], and others [3] point out that the hypotheses so far scientifically confirmed and verified in clinical practice do not explain all the causes of schizophrenia or only explain the mechanisms of the observed symptoms.

The prevalence of schizophrenia is relatively low, and is approaching 1%, whereas the incidence rate is approximately 15.2 per 100 000 population. The median risk of developing schizophrenia in one's lifetime is 7.2 per 1 000 population [4]. According to the World Health Organization [5] data, more than 20 million people worldwide suffered from schizophrenia in 2019. International epidemiological data [6] indicate that the number of people with schizophrenia increased significantly over the past three decades from 13.1 million in 1990 to 20.9 million in 2016. The authors of the study estimate that this number will continue to increase with the increasing population and the aging of society.

The literature highlights the heavy burden of the disease at both personal and social levels. Schizophrenia is considered one of the most disabling mental disorders [7-9]. Recent studies [6] have shown that in 2016 schizophrenia generated 13.4 million Years Lived with Disability (YLD), which amounts to 1.7% of all Years Lived with Disability worldwide.

The mortality rate among schizophrenia patients is 2–3 times higher than among the general population [4], and the difference has become more pronounced in the last few decades [10]. Also, life expectancy is on average 15 years shorter [11, 12], and the main causes of higher mortality are cardiovascular diseases and neoplasms [13, 14], as well as suicides [15]. The authors also point out other risk factors: adverse effects of antipsychotic agents [16, 17] and low physical activity [18]. The Disability-Adjusted Life Years (DALY) index in Poland in 1990 was 8447.6 thousand, and increased to 13414.3 thousand by 2016, i.e., by approx. 59% [19].

The stigmatization of schizophrenia patients and their families is a source of chronic stress, contributing to isolation, loneliness, and reduced quality of life [20-22]. A systematic review of studies conducted in different countries on representative samples of the general population performed by Schomerus et al. [23] showed that despite the fact that in the past few decades both the tendency to perceive mental disorders

in biomedical categories and the acceptance of professional methods of treatment improved, the attitude toward schizophrenia patients got worse. The negative social attitude often becomes a “second disease” of those who are stigmatized – marginalization is manifested by limiting access to certain forms of social participation such as education, work, or public activity.

On the economic level, schizophrenia generates high costs for the healthcare and social welfare systems, as well as lost income due to sick leave [24-26].

Millier et al. [27] analyzed access to healthcare resources in France, Germany and the United Kingdom by patients diagnosed with schizophrenia (1208 persons) every 6 months over a period of 2 years. The authors took into consideration different types of services, including psychiatric consultation, psychologist consultation, day-care treatment, and days of hospitalization. The results showed that the majority of patients sought a psychiatric consultation. During the 6 months, the majority of patients (72-82%) received psychiatric consultations 4 to 6 times, depending on the type and severity of psychopathology. Psychologist consultation was the least preferred option – few patients used this resource (0–15%), i.e., less than one visit per patient. However, those patients who sought a psychologist consultation attended 3 to 15 visits. The analysis also showed that the number of day-care treatment visits varied considerably (8 to 92). A total of 11% to 35% of the patients required hospitalization, and the length of hospitalization varied from 39 to 57 days.

Despite a relatively low prevalence, schizophrenia is one of the most significant challenges for the public healthcare system. Problems and barriers to treatment can be found in many different areas: organization and financing of the healthcare system, legislation, and policies, as well as social awareness and axiology. The quantification of psychiatric healthcare services delivered to schizophrenia patients and their long-term analysis can help highlight those areas of mental health care that require further reorganization.

Material

The starting point for this analysis is an online application released in 2019 by the Ministry of Health to analyze the problem of schizophrenia in Poland as a disease with one of the highest Disability-Adjusted Life Years (DALY) indexes [19]. The authors used the National Health Fund’s database in which patients are identified according to a unique code stored in the Common Electronic System of Population Register (PESEL). The database also includes the basic demographic variables, such as sex, age, and place of residence, as well as information on delivered services and their financing across Poland.

Method

The conducted analysis is based on psychiatric services provided to adult patients, i.e., individuals who were at least 18 years old in the year when the provision of the service ended, and whose primary disease was schizophrenia classified by ICD-10

diagnosis codes: F20.0 (paranoid schizophrenia), F20.1 (hebephrenic schizophrenia), F20.2 (catatonic schizophrenia), F20.3 (undifferentiated schizophrenia), F20.4 (post schizophrenic depression), F20.5 (residual schizophrenia), F20.6 (simple schizophrenia), F20.8 (other schizophrenia), F20.9 (schizophrenia, unspecified). Diagnosis code F20 was also included where no additional code was reported. The patients were divided into three age groups: young adults (18–39 years of age), middle-aged adults (40–59 years of age) and seniors (60+).

The reported services were analyzed according to the service delivery units and billing product codes, as specified in the Regulation of the President of the National Health Fund of 28 June 2019. Table 1 illustrates the adopted parameters.

Table 1. Service delivery setting and billing product codes

Service delivery setting	Billing product code
1. In-patient, psychiatric	
Hospital treatment (primary care)	5.15.12.0000034; 5.15.12.0000035; 5.15.12.0000036; 5.15.12.0000151; 5.15.12.0000164; 5.15.12.0000165; 5.15.12.0000166; 5.15.12.0000167; 5.15.12.4700000; 5.15.12.4700001
Hospital treatment (specialist)	5.15.12.0000040; 5.15.12.0000041; 5.15.12.0000042; 5.15.12.0000169; 5.15.12.0000223; 5.15.12.0000224; 5.15.12.0000225; 5.15.12.0000226; 5.15.12.0000227; 5.15.12.0000228; 5.15.12.0000229; 5.15.12.0000230; 5.15.12.0000231; 5.15.12.0000290; 5.15.12.0000291; 5.15.12.0000292; 5.15.12.0000293; 5.15.12.0000294; 5.15.12.0000295; 5.15.12.0000296; 5.15.12.0000297; 5.15.12.0000298; 5.15.12.0000315; 5.15.12.0000316
Hospital treatment (other)	5.15.12.0000046; 5.15.12.0000047; 5.15.12.0000048; 5.15.12.0000055; 5.15.12.0000056; 5.15.12.0000057; 5.15.12.0000152; 5.15.12.0000153; 5.15.12.0000154; 5.15.12.0000155; 5.15.12.0000156; 5.15.12.0000157; 5.15.12.0000158; 5.15.12.0000159; 5.15.12.0000160; 5.15.12.0000161; 5.15.12.0000162; 5.15.12.0000163; 5.15.12.0000168; 5.15.12.0000170; 5.15.12.0000171; 5.15.12.0000172; 5.15.12.0000173; 5.15.12.0000174
Long-term hospital treatment and care	5.15.12.0000058; 5.15.12.0000059; 5.15.12.0000061; 5.15.12.0000062; 5.15.12.0000152; 5.15.12.0000153; 5.15.12.0000154; 5.15.12.0000155; 5.15.12.0000215; 5.15.12.0000216; 5.15.12.0000217; 5.15.12.0000218; 5.15.12.0000219; 5.15.12.0000220; 5.15.12.0000221; 5.15.12.0000222
Forensic psychiatric wards (preventive measure)	5.15.12.0000064; 5.15.12.0000065; 5.15.12.0000070; 5.15.12.0000076; 5.15.12.0000077; 5.15.12.0000071; 5.15.12.0000175; 5.15.12.0000176; 5.15.12.0000203; 5.15.12.0000204
2. Day care, psychiatric	
Day care (primary care)	5.15.12.0000205; 5.15.12.0000206; 5.15.12.2700000;
Day care (specialist)	5.15.12.0000007; 5.15.12.0000009; 5.15.12.0000301; 5.15.12.0000302; 5.15.12.0000303; 5.15.12.0000304; 5.15.12.0000305; 5.15.12.0000306; 5.15.12.0000307; 5.15.12.0000308; 5.15.12.0000309
Day care (other)	5.15.12.0000004; 5.15.12.0000006; 5.15.12.0000016; 5.15.12.0000018; 5.15.12.0000022; 5.15.12.0000024; 5.15.12.0000207; 5.15.12.0000208; 5.15.12.0000209; 5.15.12.0000210; 5.15.12.0000211; 5.15.12.0000212; 5.15.12.0000213; 5.15.12.0000214; 5.15.12.0000267; 5.15.12.0000273; 5.15.12.0000275; 5.15.12.0000286

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3. In-patient, emergency room	
Emergency room consultation (no hospitalization)	5.15.19.0000211; 5.15.12.0000289; 5.15.12.4900000
4. Out-patient and community care	
Medical consultations	5.15.22.0000011; 5.15.22.0000012; 5.15.22.0000026; 5.15.22.0000027; 5.15.12.0000124; 5.15.12.0000125; 5.15.12.0000136; 5.15.12.0000137; 5.15.12.0000138; 5.15.12.0000149; 5.15.12.0000150; 5.15.12.0000257; 5.15.12.0000258; 5.15.12.1700001; 5.15.12.1700002; 5.15.12.1700003; 5.15.12.2730003; 5.15.12.2730004; 5.15.12.2730005
Psychologist consultations	5.15.22.0000028; 5.15.22.0000029; 5.15.12.0000127; 5.15.12.0000139; 5.15.12.0000259; 5.15.12.0000260; 5.15.12.1700004; 5.15.12.1700005; 5.15.12.1700013; 5.15.12.2730006; 5.15.12.2730007
Individual psychotherapy	5.15.12.0000129; 5.15.12.0000265; 5.15.12.0000266; 5.15.12.0000265; 5.15.12.0000266; 5.15.12.1700006; 5.15.12.1700007; 5.15.12.2730009; 5.15.12.2730010
Consultations / home visits	5.15.22.0000030; 5.15.12.0000135; 5.15.12.0000261; 5.15.12.0000262; 5.15.12.1700011; 5.15.12.2730001; 5.15.12.2730002
Group/family therapy	5.15.12.0000131; 5.15.12.0000132; 5.15.12.0000134; 5.15.12.0000310; 5.15.12.0000311; 5.15.12.0000312; 5.15.12.1700008; 5.15.12.1700009; 5.15.12.1700010; 5.15.12.2730011; 5.15.12.2730012; 5.15.12.2730013; 5.15.12.1700008; 5.15.12.1700009; 5.15.12.1700010; 5.15.12.2730011; 5.15.12.2730012; 5.15.12.2730013
Community mental health therapist visits	5.15.12.0000263; 5.15.12.2730008
5. Psychiatric in-patient, other	
Electric shock therapy	5.15.12.0000274

Statistical analysis includes descriptive statistics for selected features. Information on the deaths of people diagnosed with schizophrenia in 2018 comes from the Ministry of Digital Affairs.

Results

Patients – selected variables

The analysis covering the years 2009 to 2018 includes patients diagnosed with schizophrenia. Any patient might have been reported in the system more than once in following years but was accounted for only one time each year.

In 2018, the annual incidence rate was 160 854, and 6 124 deaths were reported. More than 95% of patients (152 830) were provided with the traditional model of care, i.e., received only medical consultations/in-patient treatment or medical consultations and in-patient treatment; less than 5% (8 020) were provided with a complex model, i.e., medical doctor consultations/in-patient treatment and a psychologist consultation, day-care treatment, community-based treatment.

The number of patients diagnosed with schizophrenia whose psychiatric services were reported in the system between 2009 and 2018 is presented in Table 2.

Table 2. The number of patients diagnosed with schizophrenia between 2009 and 2018

ICD10	Year										2018 vs. 2009
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	
F20	113016	111211	111866	104415	99444	94797	91194	85955	81591	78259	- 31%
F20.0	56799	59695	70052	78803	83869	86626	88137	88594	90468	92371	63%
F20.1	519	508	642	625	672	609	669	593	551	469	- 10%
F20.2	611	616	672	691	673	613	651	614	572	527	- 14%
F20.3	1157	1175	1554	1832	1922	2106	2032	2211	2256	2375	105%
F20.4	932	969	1344	1665	1703	1747	1766	1702	1612	1594	71%
F20.5	9502	9479	11463	13659	14218	14392	14311	14275	14178	14244	50%
F20.6	550	592	821	869	860	792	938	785	815	791	44%
F20.8	1035	1260	1915	1997	1947	1854	2007	2122	2211	2370	129%
F20.9	1597	2324	2576	2234	1938	1859	1810	1932	1960	1913	20%
Total	153028	155974	160702	166372	166351	165885	165051	163849	162581	160854	5%

Over the past decade, the number of schizophrenia patients receiving treatment in the public sector increased by 5%. In 2018, compared to 2009, the highest increase was recorded in the group of patients diagnosed with other schizophrenia (F20.8) (by 129%) and undifferentiated schizophrenia (F20.3) (by 105%). On the other hand, the highest decrease, i.e., by 31%, was reported for schizophrenia identified as ICD-10 F20.

Demographic variables of patients, such as sex and age, are presented in Table 3; and the place of residence in Table 4.

Table 3. Patients' sex and age in the years 2009 to 2018

Variables	Year										2018 vs. 2009
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	
Sex											
Women	80036	81400	84263	87272	86849	85878	84860	83716	82491	80895	1%
% of women	52.3%	52.2%	52.4%	52.5%	52.2%	51.8%	51.4%	51.1%	50.7%	50.3%	- 4%
Men	72993	74582	76456	79102	79502	80008	80191	80134	80090	79959	10%
% of men	47.7%	47.8%	47.6%	47.5%	47.8%	48.2%	48.6%	48.9%	49.3%	49.7%	4%
Age											
18-39	46704	47771	49016	50152	50174	49859	49255	48064	46799	45532	- 3%
% of 18-39	30.5%	30.6%	30.5%	30.1%	30.2%	30.1%	29.8%	29.3%	28.8%	28.3%	- 7%
40-59	75976	76083	76516	77186	75723	73843	71831	70345	69009	67422	-11%
% of 40-59	49.6%	48.8%	47.6%	46.4%	45.5%	44.5%	43.5%	42.9%	42.4%	41.9%	-16%

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60+	30350	32133	35190	39037	40454	42184	43966	45440	46773	47901	58%
% of 60+	19.8%	20.6%	21.9%	23.5%	24.3%	25.4%	26.6%	27.7%	28.8%	29.8%	50%
Mean age	46.2	46.2	46.5	46.8	46.9	47.2	47.4	47.6	47.8	48.1	4%

The percentage of women treated for schizophrenia was higher in the analyzed period than the percentage of men. In 2018, minor differences in the population size of female and male patients were observed, i.e., 80 895 (50.3%) and 79 959 (49.7%), respectively. A significant increase (by 58%) in the number of patients 60+ was observed.

Table 4. Patients' place of residence in the years 2009 to 2018

Place of residence	Year										2018 vs. 2009
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	
City (>100 000)	51721	52592	53355	54385	54583	54253	53371	52806	51417	50772	-2%
% of population in cities	34.0%	33.9%	33.4%	32.8%	32.8%	32.7%	32.4%	32.2%	31.9%	31.6%	-7%
Medium-sized town (20 000 to 100 000)	32679	33408	34332	35992	35964	35840	35522	35198	34595	34970	7%
% of population in medium towns	21.5%	21.6%	21.5%	21.7%	21.6%	21.6%	21.5%	21.5%	21.5%	21.8%	1%
Small town (<20 000)	22118	22408	22314	23207	23016	22316	22151	22092	21614	21781	-2%
% of population in small towns	14.5%	14.5%	14.0%	14.0%	13.8%	13.5%	13.4%	13.5%	13.4%	13.6%	-7%
Rural areas	45778	46595	49769	52224	52758	53337	53797	53747	53466	53071	16%
% of population in rural areas	30.1%	30.1%	31.2%	31.5%	31.7%	32.2%	32.6%	32.8%	33.2%	33.0%	10%

In the years from 2009 to 2018, the number of patients living in rural areas and medium-sized towns increased by 16% and 7%, respectively; meanwhile, a minor decrease was recorded in cities and small towns – by 2%.

Service delivery units

Psychiatric in-patient

The number of patients who received in-patient treatment at psychiatric hospitals in the years from 2009 to 2018 and the service delivery index are presented in Table 5.

Table 5. Number of patients (thous.) hospitalized in the years from 2009 to 2018 at hospital wards, and the service delivery index

Year	Service delivery setting					Total in hospital wards	Number of all patients	Service delivery index
	Hospital treatment (primary care)	Hospital treatment (specialist)	Hospital treatment (other)	Long-term hospital treatment and care	Forensic psychiatric wards			
2009	30.8	1.3	0.8	3.3	0.8	35.3	153.028	23.1%
2010	30.7	1.4	0.7	3.2	0.8	35.1	155.974	22.5%
2011	31.4	1.4	0.7	3.3	0.9	35.9	160.702	22.3%
2012	31.4	1.5	0.7	3.3	1.1	36.1	166.372	21.7%
2013	31.3	1.6	0.7	3.0	1.2	36.0	166.351	21.6%
2014	30.4	1.6	0.7	3.2	1.3	35.3	165.885	21.2%
2015	29.8	1.5	0.7	3.1	1.4	34.8	165.051	21.1%
2016	28.9	1.5	0.6	3.1	1.5	33.9	163.849	20.7%
2017	28.6	1.5	0.6	3.1	1.6	33.6	162.581	20.7%
2018	27.2	1.4	0.7	3.0	1.7	32.3	160.854	20.1%
2018 vs. 2009	-12%	7%	-14%	-9%	212%	-9%	5%	-15%

The “Total in hospital wards” value is not the arithmetic sum of the numbers in each row for a given year, because some patients received services at more than one type of a stationary ward in the same year.

The number of patients diagnosed with schizophrenia receiving hospital treatment reduced in 2018 compared to 2009 by 9%. The majority of in-patients were admitted to psychiatric wards, but the number of hospitalizations there decreased in 2018 by 12% compared to 2009. The number of patients staying at long-term treatment wards reduced by 9%. A significant increase (by 212%) was observed in the number of patients hospitalized at forensic psychiatric wards, and a slight increase (by 7%) in the number of patients staying at hospital wards (specialist). The service delivery index (more than 20%) has been progressively decreasing in the last decade, and in 2018 was lower by 15% than in 2009.

The reported rate of patient-days of hospitalization in the analyzed period is presented in Table 6.

Table 6. The reported rate of patient-days in psychiatric wards (thous.) in the years from 2009 to 2018, according to the type of in-patient ward

Year	Service delivery setting					Total
	Hospital treatment (primary care)	Hospital treatment (specialist)	Hospital treatment (other)	Long-term hospital treatment and care	Forensic psychiatric ward	
2009	1925.3	104.3	46.2	963.1	206.6	3245.6
2010	1885.0	108.9	41.5	976.1	229.2	3240.7
2011	1904.0	114.1	43.0	984.2	260.2	3305.6
2012	1894.8	115.2	42.7	983.3	295.8	3331.9
2013	1830.5	125.0	42.7	901.1	329.7	3228.9
2014	1790.8	118.1	37.8	978.8	367.0	3292.5
2015	1767.9	119.2	40.4	970.7	395.0	3293.2
2016	1746.6	120.3	36.5	967.7	412.9	3284.0
2017	1727.2	123.9	37.0	965.1	436.9	3290.2
2018	1633.8	116.4	40.4	955.9	473.8	3220.2
2018 vs. 2009	-15%	12%	-13%	-1%	129%	-1%

In 2018, the overall reported rate of patient-days in wards decreased by 1% compared to 2009. The reported rate of patient-days in psychiatric wards also decreased by 15%, and in the category of “other” by 13%. The reported rate of patient-days in forensic psychiatric wards increased significantly (by 129%), and only slightly (by 12%) in psychiatric rehabilitation wards. Over the last decade, the highest rate of patient-days was reported in psychiatric wards, amounting to more than 50% of care services.

The average length of hospitalization of schizophrenia patients in the years from 2009 to 2018 in general psychiatric wards is presented in Table 7.

Table 7. The average length of hospitalization of patients diagnosed with schizophrenia in the years from 2009 to 2018 in general psychiatric wards

Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Average length of hospitalization (days)	40.63	43.97	43.26	42.78	41.74	41.85	42.18	42.77	43.18	43.03

The average number of days spent in psychiatric wards by patients diagnosed with schizophrenia fluctuated slightly over the last decade – from 41 to 43 days.

Psychiatric day care

The number of patients who received treatment in psychiatric day care in the years from 2009 to 2018 and the service delivery index are presented in Table 8.

Table 8. Number of patients (thous.) who received treatment in the years from 2009 to 2018 in psychiatric day care, and the service delivery index

Year	Psychiatric day-care treatment (primary care)	Psychiatric day-care treatment (specialist)	Psychiatric day-care treatment (other)	Total at day care	Number of all patients	Service delivery index
2009	3.05	0.90	0.03	3.93	153.028	2.6%
2010	3.08	0.97	0.03	4.04	155.974	2.6%
2011	3.34	1.19	0.04	4.48	160.702	2.8%
2012	3.53	1.30	0.03	4.76	166.372	2.9%
2013	3.49	1.34	0.04	4.78	166.351	2.9%
2014	3.62	1.28	0.04	4.86	165.885	2.9%
2015	3.49	1.33	0.04	4.78	165.051	2.9%
2016	3.49	1.33	0.05	4.78	163.849	2.9%
2017	3.40	1.33	0.04	4.67	162.581	2.9%
2018	3.44	1.34	0.03	4.71	160.854	2.9%
2018 vs. 2009	13%	49%	0%	20%	5%	11%

The “Total at day care” value is not the arithmetic sum of the numbers in each row for a given year, because some patients received services in more than one type of a day-care ward in the same year.

Between 2009 and 2018, the number of all patients receiving treatment in day care increased by 20%, with the highest increase reported in specialist day care (by 49%). The majority of patients were hospitalized in day care, and these services account for more than 70% of all services reported in day-care treatment. The service delivery index remained practically the same in the last decade, i.e., nearly 3%, but in 2018 increased by 11% compared to 2009.

The reported rate of patient-days in day care in the analyzed period, according to the type of day care ward, is presented in Table 9.

Table 9. The reported rate of patient-days (thous.) in the years from 2009 to 2018, according to the type of day care

Year	Day-care treatment (primary care)	Day-care treatment (specialist)	Day-care treatment (other)	Total
2009	169.5	55.4	1.9	226.8
2010	164.9	63.8	2.0	230.8
2011	172.1	72.9	2.7	247.8
2012	179.4	80.2	2.0	261.6
2013	178.4	80.7	2.6	261.7
2014	183.8	80.6	3.1	267.5
2015	178.7	84.2	3.9	266.8
2016	182.8	84.2	3.8	270.8
2017	180.6	83.6	2.7	267.0
2018	169.5	82.1	2.3	253.9
2018 vs. 2009	0%	48%	18%	12%

In 2018, the reported rate of patient-days in day care increased by 12% compared to 2009, with the highest increase (by 48%) recorded in specialist day care treatment. In the last decade, the highest rate of patient-days was reported in general day care wards – nearly 70% of “psychiatric day-care” services.

The number of patients who received treatment in psychiatric day care wards in the years from 2009 to 2018 and the number of patient-days reported annually per patient are presented in Table 10.

Table 10. The number of patients (thous.) who received treatment in day care in the years from 2009 to 2018, and the number of patient-days reported annually per patient

Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Number of patients	3.05	3.08	3.34	3.53	3.49	3.62	3.49	3.49	3.40	3.44
Number of patient-days per patient	55.60	53.53	51.61	50.85	51.12	50.83	51.13	52.41	53.16	49.26

The number of patient-days in the general day care wards reported annually per patient decreased in 2018 by 7 days (11%) compared to 2009.

Psychiatric out-patient and community care

The number of patients who received out-patient services and community-based care in the years from 2009 to 2018 is presented in Table 11.

Table 11. The number of patients (thous.) who received psychiatric out-patient and community care in the years from 2009 to 2018

Year	Medical consultations	Psychologist consultations	Individual psychotherapy	Visits / home consultations	Group / family therapy	Community mental health therapist visits	Total
2009	135.91	9.07	0.00	5.92	1.08	0.32	138.39
2010	138.49	8.02	2.24	5.52	0.91	0.39	141.16
2011	142.85	8.50	2.25	6.28	0.88	0.46	145.78
2012	148.41	9.54	2.29	7.20	0.80	0.56	151.62
2013	148.51	9.66	2.64	7.68	0.66	0.54	151.94
2014	147.66	9.13	2.77	7.68	0.59	0.44	151.22
2015	146.80	8.77	2.68	8.04	0.52	0.46	150.48
2016	145.88	8.64	2.77	8.15	0.53	0.60	149.52
2017	144.25	8.56	2.86	8.35	0.55	0.58	148.08
2018	142.15	8.57	3.14	8.73	0.61	0.60	146.10
2018 vs. 2009	5%	-6%	-	32%	-77%	53%	6%

The “Total” value is not the arithmetic sum of the numbers in each row for a given year, because some patients received different psychiatric out-patient or community-based treatment in the same year.

Over the last decade, the most favored method of therapy was medical consultations (nearly 90%), while the least favored methods were: community mental health therapist visits (up to 0.4%), visits/home consultations (5%), psychologist consultations (6%), group/family therapy (less than 1%). The number of patients who received group/family therapy or psychologist consultations decreased in 2018 compared to 2009 by 77% and 6%, respectively. No patients receiving individual therapy were reported in 2009 (probably due to the regulation of reporting and billing), whereas in 2018 more than 3 000 patients received this form of therapy. More patients received home consultations/home visits (by 32%) and community mental health therapist services (by 53%).

The number of different types of psychiatric out-patient and community care reported in the years from 2009 to 2018 is presented in Table 12.

Table 12. The number of psychiatric out-patient and community care services (thous.) reported in the years from 2009 to 2018

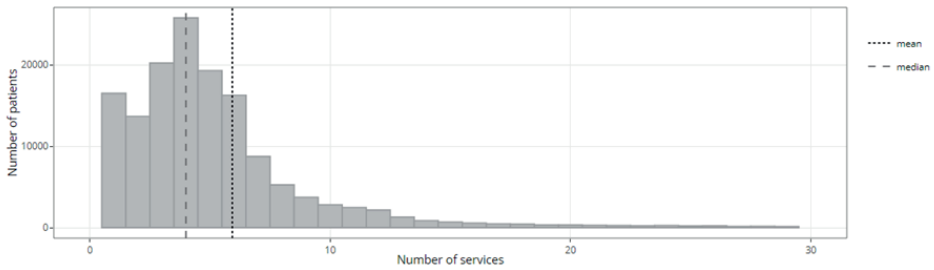
Year	Medical consultations	Psychologist consultations	Individual psychotherapy	Visits / home consultations	Group / family therapy	Community mental health therapist visits	Total
2009	720.9	38.6	0.0	40.3	9.9	3.1	812.9
2010	718.1	29.0	12.8	40.5	9.2	3.9	813.5
2011	721.9	30.7	14.8	51.0	10.1	4.5	833.0
2012	729.5	36.4	15.9	60.4	10.2	5.2	857.7
2013	746.7	39.9	19.3	75.2	9.5	4.7	895.3
2014	741.7	39.9	21.5	83.2	8.3	4.3	898.9
2015	725.0	40.2	22.3	89.4	9.4	5.3	891.6
2016	714.2	40.4	23.8	95.7	8.1	4.5	886.7
2017	697.6	42.0	26.7	100.5	8.9	4.3	879.9
2018	674.5	40.6	29.4	108.6	9.3	4.2	866.5
2018 vs. 2009	-6%	5%	-	163%	-6%	26%	6%

In 2018, the total number of reported out-patient and community care services increased by 6% compared to 2009. The most frequently reported group of services in this category was medical consultations (nearly 78% of all services), followed by visits/home consultations (12.5%), psychologist consultations (4.7%), individual therapy (3.4%), group/family therapy (1.1%), community mental health therapist visits (0.5%).

The distribution of the number of individually reported out-patient services and community care in 2018 (all types) is presented in Figure 1.

In 2018, most of the patients received 4 consultations/visits, and that was also the median of the number of services.

The number of individually reported out-patient services and community care in 2018, according to the type of services, is presented in Table 13.



The highest value on the X axis was 146, but due to readability and the number of patients close to 1, the scale was shortened.

Fig. 1. Distribution of the number of individually reported out-patient services and community care in 2018 in categories: medical consultations, psychologist consultations, group/family therapy, visits/home consultations, individual psychotherapy, and community mental health therapist visits

Table 13. Tendency measures of central distributions of the number of individual reported out-patient services and community care in 2018, in the following types of services: medical consultations, psychologist consultations, group/family therapy, visits/home consultations, individual psychotherapy, and community mental health therapist visits

Measures	Medical consultations	Psychologist consultations	Individual psychotherapy	Visits / home consultations	Group / family therapy	Community mental health therapist visits	Total
Mean	5	5	9	12	15	7	5
Median	4	2	5	5	3	5	4
Dominant	4	1	1	1	1	1	4
Number of patients*	26 560	2 844	734	3 018	107	121	25 742

* This is how many patients took advantage of particular types of services in the case of the most frequent number in the studied group. The total value applies to all patients, without the breakdown into particular types of services. It is not a sum of values from individual columns, as some patients used various types of services.

In 2018, the largest number of patients received medical consultations, the smallest group/family therapy, community mental health therapist visits and individual

psychotherapy. The dominant of medical consultation is 4; the dominant of each of the remaining types of services is 1.

Discussion

The purpose of this population study is to provide information on the use of public mental health care resources by patients diagnosed with schizophrenia. The analysis of the services reported in the years from 2009 to 2018, according to billing product codes, may be used both to assess the functioning of the mental health care system and to make management prognoses. According to the authors, this is particularly important in relation to patients diagnosed with schizophrenia due to the severe burden of this disease in the personal and social dimensions [6, 22, 25], and the high burden of mental health care [28] related not only to the complex needs of the service users but also to the necessity to provide assistance to patients' families/relatives [29].

It is estimated that the prevalence of schizophrenia is approaching 1%. In 2018, the annual prevalence was 160 854 patients, i.e., 0.4% of the total population of Poland [30]. This might suggest that some patients do not use the services financed by the National Health Fund.

In Poland, the number of patients diagnosed with schizophrenia who received services in the public sector increased in the years from 2009 to 2018 by 5%. This is in line with the estimates of international epidemiological studies [6] based on which the number of schizophrenia patients will be increasing along with the rising global population and the aging of societies. The highest increase in the number of patients was recorded in the group diagnosed with other schizophrenia (F20.8) and undifferentiated schizophrenia (F20.3) by 129% and 105%, respectively. It is difficult to interpret this result unequivocally, because on the one hand it may indicate the imperfections of the ICD-10 classification, and on the other hand, it may result from non-clinical conditioning. A significant problem in Polish mental health care is the lack of reimbursement of medications for people with schizoaffective disorder (F25), which means that for some patients, specialists are prone to diagnose schizophrenia or bipolar disorder instead. A constructive solution would be for the National Health Fund to regulate the reimbursement of medications for people with schizoaffective disorder (F25). Notably, there is a low number of patients diagnosed with hebephrenic schizophrenia. Decrement in prevalence of this diagnosis was pointed out by some authors analyzing the years 1920–1966 [31] and 1900–1979 [32].

The results of epidemiological studies taking into consideration the patients' sex are inconclusive – some authors argue that schizophrenia is more prevalent in men than it is in women [4, 33], others that the prevalence is the same in both sexes [6].

Our analysis shows that over the last decade the number of women undergoing treatment increased and is higher than the number of men. Perhaps in Poland, similar to other European countries [34], men are less willing to use mental health care services. The observed largest increase in the number of treated patients living in the countryside – by 16% – is surprising since urbanization is mentioned as one of the factors contributing to the emergence of schizophrenia [35]. However, this result is

reflected in the general modern trend of people migrating from cities to suburbs or rural areas [36].

One of the positive findings is that in 2018 the number of patients undergoing in-patient treatment decreased by 9% compared to 2009, while the number of patients receiving out-patient and community care increased by 6%. A possible explanation is that there is an ongoing deinstitutionalization – in the years from 2010 to 2016 in Poland the number of in-patient wards decreased by 4%, while the number of community mental health facilities increased by 253% [37]. On the other hand, the disturbing trends in the analyzed decade include a very high (by 212%) increase in the number of patients hospitalized in forensic psychiatry departments. Equally alarming is the increase in the number of patient-days reported in this category – from nearly 207 thous. in 2009 to nearly 474 thous. in 2018. This is an increase of 129%, which indicates a significant increase in the average length of stay: the average length of hospitalization in forensic psychiatry departments in 2009 was 258 days, and in 2018 – 279 days. Perhaps an increase in the number of hospitalized patients and the extension of hospitalization by an average of 21 days is related to the adoption of the Act of 22 November 2013 – known as *Lex Trynkiewicz* on proceedings against persons with mental disorders that pose a threat to the life, health or sexual freedom of other people (Journal of Laws of 2014, item 24). Interestingly, in the years 1990-2012 a significant increase in the demand for beds in forensic psychiatry departments in Western Europe was also observed [38]. The reasons for this tendency remain unclear. Detailed information on the clinical characteristics of the patients receiving the treatment in forensic psychiatry departments should be obtained and the reasons for their detention.

One of the indicators measuring the effectiveness of management and efficiency of the system is the length of psychiatric hospitalization [39]. In Canada, in the years from 2005 to 2015 patients diagnosed with schizophrenia spectrum disorders were hospitalized for an average of 97 days [40]. According to the WHO data [41], the longest lengths of hospitalization of schizophrenia patients were reported in the United Kingdom (132 days on average), the Czech Republic (89 days), Finland (71 days), and Poland (45 days), while the shortest lengths of stay were recorded in Denmark (6 days). In a study conducted in France, Germany and the United Kingdom, the length of hospitalization ranged from 39 to 57 days [27]. In Poland, the average length of hospitalization in a general psychiatric ward was 43 days in 2018, which is more than the EU estimated average of 38.5 days [42]. The above-cited results are difficult to interpret due to methodology differences. However, it can be assumed that in Poland the length of hospitalization is influenced not only by the structure of the mental health care system – the dominance of a one-dimensional and poor offer of large and distant psychiatric hospitals with a significant shortage of community care [43] but equally important socio-cultural factors and the current method of financing hospitalization – accounting for a “patient-day.”

In the years from 2009 to 2018, a very small proportion of patients (less than 3%) received day-care treatment, the length of which also decreased to an average of 49 days in 2018. This was most likely due to limited access to this form of therapy,

resulting from a small number of day care wards (in 2018, out of 380 townships and country districts only 31% had a day care ward in its territory), as well as geographic location (the distance from the patient's place of residence was too far since one-way travel should not last longer than 60 minutes) [44].

In 2018, the total number of reported out-patient services and community care delivered to schizophrenia patients increased by 6% compared to 2009. Notably, in the last decade, medical consultations became the most favored form of services in this category. Less than 10% of patients sought other forms of out-patient or community care. The fact that the number of services reported in the category of consultations/home visits has increased significantly (by 169%) is a positive trend, demonstrating that community-based services are developing, even though they currently constitute only 16% of all out-patient services. It is difficult to offer a conclusive interpretation of the fact that the number of patients undergoing group/family therapy or support, the forms of therapy considerably enhancing the recovery process [45], is decreasing (by 77%). The reasons might include: the current method of financing and service billing adopted by the National Health Fund, and organizational problems. In Great Britain the contributing factor turned out to be the patients' reluctance regarding any contacts with mental health care other than seeing a doctor [46]. Similar observations are actual for France and Germany [27], where within 6 months only about 15% of patients diagnosed with schizophrenia sought psychological assistance.

The 2018 analysis shows a definitely small number of out-patient services and community care reported per patient over 12 months – four visits/consultations on average. These are mainly medical consultations, while for the remaining types of services, the dominant value is one. To be able to identify the reasons behind this trend, e.g., no need for more frequent contacts, avoidance, or limited access to consultations, would require qualitative research. By comparison, most of the patients (72%–82%) in France, Germany, and Great Britain [27] had 4 to 6 psychiatric visits within 6 months, depending on the type and severity of their psychopathology. However, the system in Germany is not based on contracted limits, unlike in Poland, where the National Health Fund contracts a specific number of points and the number of appointments must not exceed the agreed limit.

The main limitation of the presented analysis is that it only takes into account information obtained from the database of the public payer of health services – the National Health Fund. These databases include only basic socio-demographic variables, incomplete medical information, and fragmented organizational data. Extending the analysis to the private sector would ensure a more complete picture of the system functioning and allow specialists to prepare more robust forecasts of services delivery to this group of patients.

No economic analysis was made to enable optimization of the care pathway [47].

Conclusions

1. Between 2009 and 2018, the number of patients diagnosed with schizophrenia treated in the public sector increased by 5%.

2. In the analyzed years, the number of in-patients decreased by 9%, while the number of people using out-patient services and community-based treatment increased by 6%.
3. A high increase in the number of in-patients (by 212%) and lengths of stay (279 days in 2018) was observed in forensic psychiatric wards.
4. The average length of hospital stay at a general psychiatric ward fluctuated slightly and in 2018 was 43 days.
5. A very low percentage of patients diagnosed with schizophrenia (less than 3%) sought day-care treatment.
6. In out-patient treatment, medical consultations were the preferred form of assistance; less than 10% of patients used other types of services. In 2018, four visits/consultations on average were reported per patient. The number of patients receiving group/family therapy or support decreased considerably (by 77%).
7. In 2009-2018, most patients (over 95%) diagnosed with schizophrenia were treated using the traditional model of care: medical consultation and psychiatric hospitalization. It is advisable to reorganize the system – implementation and development of comprehensive care coordinated within the community care model.

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Address: Sylwia Paciorek
Ministry of Health
00-952 Warszawa, Miodowa Street 15
e-mail: s.paciorek@mz.gov.pl