

Epidemiological characteristics of 214063 hospital admissions to adult urological departments-Poland, 2022

Gabriela Moczeniat^{1,2}, Mateusz Jankowski³, Paweł Goryński³, Mariusz Gujski¹

¹Department of Public Health, Medical University of Warsaw, Warsaw, Poland

²Department of Urology, Mazovia Hospital Warsaw, Warsaw, Poland

³School of Public Health, Centre of Postgraduate Medical Education, Warsaw, Poland

Citation: Moczeniat G, Jankowski M, Goryński P, Gujski M. Epidemiological characteristics of 214063 hospital admissions to adult urological departments-Poland, 2022. Cent European J Urol.2024; doi:10.5173/ceju.2024.55 [Epub ahead of print]

Article history

Submitted: March 30, 2024

Accepted: April 24, 2024

Published online: June 18, 2024

Corresponding author

Gabriela Moczeniat
Mazovia Hospital Warsaw
Department of Urology
Komisji Edukacji
Narodowej Av. 47/U15
02-797 Warsaw, Poland
nauka@grupamazovia.pl

Introduction Nationwide data on urological hospitalizations may improve the quality of care. This study aimed to evaluate the epidemiological characteristics of 214063 hospital admissions to adult urological departments in Poland in 2022.

Material and methods This epidemiological retrospective analysis is based on the nationwide registry on hospital admissions managed by the Nationwide Institute of Public Health NIH – Nationwide Research Institute. All adult patients admitted to urological departments were included in the analysis.

Results In 2022, 214063 hospital admissions were recorded in Polish urological departments, 72% of the patients were male. Emergency admissions accounted for 17.6% of admissions to urological departments. There were significant differences in hospitalization rate per 100000 population between the administrative regions (voivodships), with extreme values recorded in the Opolskie (411.5) and Podkarpackie (987.9) voivodships. The major causes of admission were genitourinary (ICD-10:N00-N99) diseases (59%) or cancers (36%) (ICD-10:C00-C97;D00-D48). In general, kidney and ureteral stones (19.9%), bladder cancer (15.2%), and prostate hyperplasia (10%) were the most common causes of hospital admissions. The higher hospitalization rate per 100000 inhabitants was observed among adults aged 60–69 and 70–79 years. A quarter of hospitalizations were one-day hospitalizations, and the mean duration of hospitalization was 2.93 days for all hospitalizations, and when excluding one-day hospitalizations 3.89 days. Epidemiological characteristics of patients and duration of hospitalization differed by cause of admission.

Conclusions Findings from this study provide precise epidemiological data on inpatient urological care in Poland. Physicians and policymakers may use this study to evaluate and improve inpatient urological care in Poland.

Key Words: urology ↔ hospitalization ↔ Poland ↔ urological care ↔ nationwide data

INTRODUCTION

Urological diseases are a wide group of urinary tract diseases, pelvic conditions, and genital conditions [1–4]. The most prevalent urological diseases are urinary tract infections (UTIs), urolithiasis, bladder control problems, and prostate hyperplasia [1, 2, 4]. Moreover, urologists also treat onco-

logical diseases, such as prostate cancer, bladder cancer, and kidney cancer [3].

Globally, over 150 million cases of community-acquired UTIs are reported annually [2]. Global prevalence of urolithiasis ranges from 1% up to 13% [1]. Socioeconomic changes and changes in lifestyle habits led to a rise in urolithiasis incidence from 77.78 million incident cases in 1990 to 115.55 million in 2019

(an increase of 48.57%) [1]. Population aging and an increase in expected life expectancy led to an increase in the global prevalence of prostate hyperplasia, from 51.1 million cases in 2000 to 94 million cases in 2019 [4]. A significant rise in the global prevalence of urological cancers is observed globally. Between 1990 and 2019 the global incidence of kidney cancer increased by 155%, bladder cancer by 123%, and prostate cancer by 169% [5]. The growing global burden of urological diseases will lead to increased utilization of urological care [3–5]. Urological diseases are treated both in outpatient and inpatient settings. A significant part of urological care is related to surgical procedures both diagnostics (e.g., biopsy, cystoscopy, ureteroscopy) and treatment (e.g., lithotripsy, cancer resection) [6]. The organization of urological care differs across the countries.

In Poland, as of January 2024, there were 1461 active urologists and 79 pediatric urologists [7]. Urological care is offered both by public and private institutions and funded under mandatory health insurance (public services within the insurance – National Health Fund) or private healthcare services (paid-for service) [8]. There are both public and private medical facilities offering inpatient urological care. Patients admitted to urological departments within the public funding system require a referral and are admitted according to position on the waiting list [9]. Waiting time differs between the medical facilities and departments [10]. A total of 881 urology clinics offered a medical consultation within the mandatory health insurance in January 2024 [10]. There are approximately 120 urological departments in Poland [10]. Urological departments are most often part of multi-profile public hospitals located in larger cities. Urological departments are also managed by private medical facilities, mostly as mono-profile hospitals [8, 11].

Patients with urological diseases are referred to urological departments mainly for diagnosis and treatment using surgical procedures (including minimally invasive surgery) [11, 12]. A significant part of urological hospital care is one day surgery admissions, mostly related to radiological tests (e.g., urography), ultrasound-guided prostate biopsy, non-surgical breaking of stones, as well as endoscopic examinations and procedures [13].

Data on patients admitted to urological departments are limited to single-center or multicenter studies, wherein there is a lack of nationwide data on urological inpatient care in Poland [14–16].

Therefore, this study aimed to evaluate the epidemiological characteristics of 214 063 hospital admissions to adult urological departments in Poland between January and December 2022.

MATERIAL AND METHODS

Data source and data collection methods

This epidemiological retrospective analysis is based on the nationwide registry on hospital admission managed by the Nationwide Institute of Public Health NIH – Nationwide Research Institute [17]. Under the Polish law on nationwide statistics, all public and private hospitals (except the psychiatric units) are obligated to report data on hospitalized patients using a discharge report template. Data from discharge reports are collected and aggregated by the Nationwide General Hospital Morbidity Study Registry scientific board [17]. All medical facilities are trained on reporting procedures by the representatives of the Nationwide Institute of Public Health NIH - Nationwide Research Institute. Discharge reports include demographic data (gender, age, place of residence), hospital characteristics, admission details (dates of admission, type of admission, cause of admission, hospital wards), comorbidities, and outcome of hospitalization (duration of hospitalization and its course). Data are coded with personal data protection rules and are anonymous. Data on medical conditions are based on the 10th revision of the International Statistical Classification of Diseases and Related Health Problems (ICD-10) [18] and filled out by physicians.

Data were obtained from the Nationwide Institute of Public Health NIH – Nationwide Research Institute based on the request for public information for scientific purposes.

Hospital admissions to urological departments

Data on all patients admitted to adult urological departments were included in this study. Hospital admissions to urological departments were identified using the medical codes for hospital departments and other hospital care units listed in the Ordinance of the Ministry of Health on May 17, 2012 [19]. Urological departments were identified using code “4640” as listed in the Ordinance of the Ministry of Health [19]. Data on patients (a total of 15996 patients in 2022) who were transferred to the urology department from other departments (the urology department was not the first admission department) were not included in this study.

Causes of hospitalization (primary diagnosis) were defined by physicians in discharge reports using ICD-10 codes [18]. Patients hospitalized due to genitourinary diseases were identified using ICD-10 codes N00-N99. Patients hospitalized due to cancers were identified using ICD-10 codes C00-C97 and D00-D48 [18].

The following ICD-10 codes were used to identify patients with selected diseases: prostate cancer (C61), kidney cancer (C64), bladder cancer (C67), neoplasm of uncertain or unknown behavior of male genital organs (D40), neoplasm of uncertain or unknown behavior of urinary organs (D41), obstructive and reflux uropathy (N13), kidney and ureteral stones (N20), stones of lower urinary tract (N21), unspecified renal colic (N23), urethral stricture (N35), and hyperplasia of prostate (N40) [17].

The type of hospital admission was based on the discharge data and classified into two categories: emergency admission and scheduled admission.

If physicians filled out data on secondary diagnoses and co-existing diseases in discharge reports, patients were classified as those with comorbidities.

The comparable methodology was used in previously published retrospective epidemiological analyses based on the Nationwide General Hospital Morbidity Study Registry [20,21].

Statistical analysis

The data were analyzed with IBM SPSS Statistics v.29 (USA: IBM, Armonk, NY). Epidemiological characteristics of patients admitted to urological departments were presented with descriptive statistics typical for registry-based studies. As the nationwide data were used, hospital admissions per 100,000 adult inhabitants were calculated based on the demographic data from Statistics of Poland (Statistical Yearbooks. Demographic Yearbook of Poland 2022) [22], including data on age, gender, and adminis-

trative region of residence. A separate analysis was conducted for the most common causes of admission to urological departments.

Ethical statement

The Ethical Committee at the Medical University in Warsaw, Poland approved the study protocol, decision AKBE/338/2023 as of December 2023. The study was carried out following the Declaration of Helsinki regulations. Patient consent was waived as anonymous and retrospective data from public statistics (Nationwide General Hospital Morbidity Study Registry) were used.

RESULTS

Number of hospital admissions to urological departments in 2022

In 2022, a total of 214063 hospital admissions to urological departments (for adults) were reported. Almost three-quarters of patients admitted to urological departments were males (Table 1). Emergency admissions accounted for 17.6% of admissions to urological departments in 2022. Monthly number of hospital admissions varied from 15338 in January and 15346 in February to 19709 in March and 19668 in May (Table 1).

In 2022, there were 692.4 hospital admissions per 100,000 adult inhabitants in Poland. There were markable differences in the hospital admissions per 100,000 adult inhabitants by administrative regions

Table 1. Number of hospital admissions to urological departments per month, January-December 2022

Month	Overall (n = 214063)		Gender				Type of hospital admission			
			Male (n = 155349)		Female (n = 58714)		Emergency (n = 37669)		Scheduled (n = 176394)	
	n	%	n	%	n	%	n	%	n	%
January	15338	7.2	11172	7.2	4166	7.1	2856	7.6	12482	7.1
February	15346	7.2	11330	7.3	4016	6.8	2694	7.2	12652	7.2
March	19709	9.2	14353	9.2	5356	9.1	3270	8.7	16439	9.3
April	17238	8.1	12551	8.1	4687	8.0	3149	8.4	14089	8.0
May	19668	9.2	14233	9.2	5435	9.3	3424	9.1	16244	9.2
June	18287	8.5	13283	8.6	5004	8.5	3199	8.5	15088	8.6
July	17899	8.4	12936	8.3	4963	8.5	3296	8.7	14603	8.3
August	18363	8.6	13377	8.6	4986	8.5	3606	9.6	14757	8.4
September	18092	8.5	13070	8.4	5022	8.6	3212	8.5	14880	8.4
October	18760	8.8	13595	8.8	5165	8.8	3161	8.4	15599	8.8
November	19564	9.1	14014	9.0	5550	9.5	3178	8.4	16386	9.3
December	15799	7.4	11435	7.4	4364	7.4	2624	7.0	13175	7.5

(voivodeships). The number of hospital admissions per 100,000 adult inhabitants in Opolskie (411.5), Wielkopolskie (469.0), Małopolskie (471.4) and Zachodniopomorskie (475.1) Voivodeships was almost two times lower than in Kujawsko-pomorskie (829.6) and Podkarpackie (987.9) Voivodeships (Table 2). Over one-quarter of all hospital admissions to urological departments took place in Śląskie and Mazowieckie Voivodeships (Table 2).

Age of the patients admitted to urological departments

Most of the patients (58.8%) admitted to urological departments were aged 60–79 years, wherein there were 39564 hospital admissions of patients aged 65–69 years and 38065 hospital admissions of patients aged 70–74 years (Figure 1).

Epidemiological characteristics of patients admitted to urological departments

One-quarter of hospitalizations (24.6%) were one-day hospitalizations (<24h). The mean duration of hospitalization was 2.93 ± 3.62 days, median of 2 days. When excluding one-day hospitalizations, the mean duration of hospitalization was

Table 2. Regional differences in the number of hospital admissions to urological departments in Poland in 2022

Voivodeship	Number of hospital admissions	Hospital admissions per 100,000 adult inhabitants	Percentage of total admissions
Dolnośląskie	13574	530.1	6.3
Kujawsko-pomorskie	14533	829.6	6.8
Lubelskie	13972	788.8	6.5
Lubuskie	5592	651.1	2.6
Łódzkie	17258	817.0	8.1
Małopolskie	13811	471.4	6.5
Mazowieckie	31323	663.6	14.6
Opolskie	3451	411.5	1.6
Podkarpackie	17707	987.9	8.3
Podlaskie	5708	575.3	2.7
Pomorskie	14865	737.3	6.9
Śląskie	24922	649.6	11.6
Świętokrzyskie	8051	766.9	3.8
Warmińsko-mazurskie	8335	701.0	3.9
Wielkopolskie	14038	469.0	6.6
Zachodniopomorskie	6923	475.1	3.2
Total	214063	692.4	100.0

3.89 ± 3.69 days, a median of 2 days. Almost all of the patients (99.1%) were hospitalized in one ward (only the urological department, without transfer to other wards). A total of 716 (0.3%) in-hospital deaths were reported. Most of the patients were admitted to urological departments due to genitourinary diseases (59%) or cancers (36%), and 5% of patients were admitted due to other medical conditions (Table 3). Kidney and ureteral stones (19.9%) was the most common cause of admission to urological departments (Table 3). Out of all genitourinary cancers, bladder cancer (15.2%) was the most common cause of admission. One-tenth of hospital admissions were caused by hyperplasia of the prostate (Table 3). In general, diseases of male genital organs (N40-N51) accounted for 16.6% of all hospital admissions to urological departments. According to the data available in the nationwide registry, physicians working in urological departments reported that only 16.7% of patients admitted to urological departments had comorbidities (Table 3).

Age-differences in the causes of hospital admissions to urological departments

The highest hospitalization rate per 100,000 inhabitants was observed among adults aged 70–79 years (1925.8 per 100,000 inhabitants). The hospitalization rate per 100,000 inhabitants for all major causes of hospitalization doubled in a group aged 50–59 years (610.6) compared to a group aged 40–49 (317.8). Moreover, a remarkable increase in hospitalization rate per 100,000 inhabitants was observed between 50–59 and 60–69 years. Details are presented in Table 4.

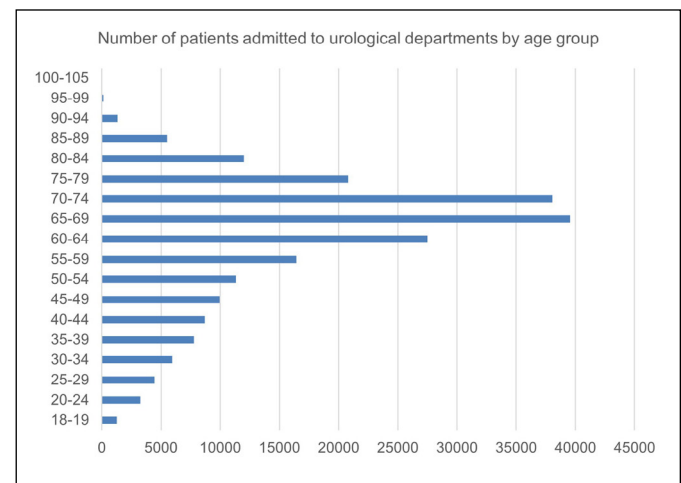


Figure 1. Number of patients admitted to urological departments by age group.

Table 3. Characteristics of patients admitted to urological departments in 2022

Variable	Overall n = 214063	
	n	%
Gender		
male	155349	72.6
female	58714	27.4
Age		
18–29	8959	4.2
30–39	13737	6.4
40–49	18649	8.7
50–59	27768	13.0
60–69	67061	31.3
70–79	58885	27.5
80–89	17531	8.2
90+	1473	0.7
One-day hospitalization (<24h)		
yes	52573	24.6
no	161490	75.4
Duration of hospitalization (days) mean ±SD; median (min–max)	2.93 ±3.62 2 (0–275)	
Duration of hospitalization when excluded one-day hospitalizations (days) (n = 161490) mean ±SD; median (min–max)	3.89 ±3.69 2 (1–275)	
Type of admission		
emergency	37669	17.6
scheduled	176394	82.4
Number of hospital wards		
1	212219	99.1
2	927	0.4
3	820	0.4
4	48	0.1
5	49	0.1
Cause of admission		
cancers (C00–C97; D00–D48)	76957	36.0
prostate cancer (C61)	13123	6.1
kidney cancer (C64)	5402	2.5
bladder cancer (C67)	32553	15.2
neoplasm of uncertain or unknown behaviour of male genital organs (D40)	6535	3.1
neoplasm of uncertain or unknown behaviour of urinary organs (D41)	15207	7.1
genitourinary diseases (N00–N99)	126270	59.0
obstructive and reflux uropathy (N13)	20975	9.8
kidney and ureteral stones (N20)	42504	19.9
stones of lower urinary tract (N21)	3085	1.4
unspecified renal colic (N23)	1058	0.5
urethral stricture (N35)	5486	2.6
hyperplasia of prostate (N40)	21382	10.0
redundant prepuce, phimosis and paraphimosis (N47)	5287	2.5
other causes	10836	5.0
In-hospital death		
yes	716	0.3
no	213347	99.7
Data on comorbidities reported in the registry		
yes	35780	16.7
no	178283	83.3

Characteristics of patients admitted to urological departments with common urological conditions

Three-quarters of patients hospitalized due to bladder cancer were males (Table 5), the mean age was 70.2 years, and the mean duration of hospitalization was 3 days. One-third of hospitalizations led to the completion of the therapeutic or diagnostic process, and 66.9% ended up with a referral for further treatment in the outpatient clinic (Table 5). Out of all patients admitted due to kidney and ureteral stones, 57.2% were males, the mean age was 54.4 years, almost one-quarter of admissions were in emergency mode, and 23.5% lasted less than 24 hours (Table 5). Most of the patients hospitalized due to obstructive and reflux uropathy were females (52.1%), the mean age was 60.4 years and 23% of patients had comorbidities. One-third of patients (30.6%) were admitted in emergency mode and 28% of hospital admissions lasted less than 24 hours (Table 5). The mean age of patients admitted due to prostate cancer was 67.3 years and the mean duration of hospitalization was 4 days (Table 6). Among patients admitted due to hyperplasia of the prostate, the mean age was 69.4 years and the mean duration of hospitalization was 2.9 days. Among males admitted due to prostate cancer or hyperplasia, approximately one-third of admissions ended up with completion of the therapeutic or diagnostic process (Table 6).

DISCUSSION

This is the first characteristic of patients admitted to urological departments carried out based on a nationwide registry that provides detailed epidemiological data on inpatient urological care in Poland. In 2022, 214063 hospital admissions to urological departments were reported, without remarkable seasonal differences in particular months. There were significant differences in the urological hospitalization rates between the administrative regions (Voivodeships) that point out potential health inequalities in urological care. Over 70% of patients admitted to urological departments were males and the most of the patients were aged 65–74 years. One-quarter of hospitalizations lasted up to 24 hours and were related to one-day surgery and diagnosis. Kidney and ureteral stones (19.9%), bladder cancer (15.2%), and hyperplasia of the prostate (10%) were the most common causes of admission to the urological department.

In 2022, over 200000 hospital admissions to urological departments were reported, which confirms that urological care is a significant part of inpatient

medical care. There were no markable seasonal differences in the number of hospital admissions per month, with a slight decrease in the first two months of the year. Since March 2022, most of the anti-epidemic restrictions have been lifted which may lead to an increase in the number of hospital admissions between February and March 2022 [23]. This nationwide registry-based study revealed significant (up to twofold) differences in urological hospitalization rates between administrative regions in Poland. This observation may result from the access to urological care services in particular regions. Moreover, further analyses are needed to assess the regional differences in the exposure to urological disease risk factors [24]. Health policymakers should use the findings from this study to reduce health inequalities in access to urological care in Poland.

Gender and age are well-known factors associated with the risk of urological diseases [25, 26]. For example, gender discrepancy exists in the incidence

of kidney cancer, bladder cancer, and urolithiasis, with a higher prevalence among males [25,26]. Findings from this study revealed that 72% of patients admitted to urological departments were males. However, the prevalence of kidney and ureteral stones was only slightly higher among males which is in line with the previously reported data on the prevalence of urolithiasis and its risk factors like obesity [27]. Out of all major causes of admission to urological departments, obstructive and reflux uropathy was more common among females than males. Older age is a risk factor for numerous urological diseases, especially among males (diseases of the prostate) [28,29]. In 2022, the highest urological hospitalization rate was observed among adults aged 65–74 years. We can hypothesize that reaching retirement age (65 years for men) has an impact on the attitudes towards urological screening and visiting urologists that lead to hospitalization due to urological conditions. Age differences in hospital admissions to the urological depart-

Table 4. Causes of hospital admission to urological department by age groups in Poland in 2022

		18–29	30–39	40–49	50–59	60–69	70–79	80+
Overall (all causes of hospitalizations in urological departments)	n	8959	13737	18649	27768	67061	58885	19004
	rate per 100,000	184.8	232.0	317.8	610.6	1328.0	1925.8	1171.3
kidney cancer (C64)	n	20	116	468	890	1830	1732	346
	rate per 100,000	0.4	2.0	8.0	19.6	36.2	56.6	21.3
bladder cancer (C67)	n	45	181	690	2590	11273	12733	5041
	rate per 100,000	0.9	3.1	11.8	56.9	223.2	416.4	310.7
obstructive and reflux uropathy (N13)	n	1072	1795	2367	3007	5946	4767	2021
	rate per 100,000	22.1	30.3	40.3	66.1	117.7	155.9	124.6
kidney and ureteral stones (N20)	n	2489	5752	7752	8491	10971	5832	1227
	rate per 100,000	51.3	97.1	132.1	186.7	217.3	190.7	75.6
stones of lower urinary tract (N21)	n	55	105	130	293	1063	1067	372
	rate per 100,000	1.1	1.8	2.2	6.4	21.0	34.9	22.9
unspecified renal colic (N23)	n	163	188	222	200	185	83	17
	rate per 100,000	3.4	3.2	3.8	4.4	3.7	2.7	1.0
urethral stricture (N35)	n	165	268	349	476	1631	1885	712
	rate per 100,000	3.4	4.5	5.9	10.5	32.3	61.6	43.9
prostate cancer (C61)	n	1	2	180	1529	6459	4316	636
	rate per 100,000 (only males)	0.0	0.1	6.1	68.3	278.5	345.0	127.3
hyperplasia of prostate (N40)	n	8	33	271	1958	8393	8423	2296
	rate per 100,000 (only males)	0.3	1.1	9.2	87.5	361.9	673.2	459.7
redundant prepuce, phimosis and paraphimosis (N47)	n	1472	638	586	552	883	782	374
	rate per 100,000 (only males)	59.6	21.2	19.8	24.7	38.1	62.5	74.9

n – number of patients; SD – standard deviation

ment presented in this study may be used by urologists to assess the age of diagnosis of urological diseases and monitor current trends in urological disease onset.

One-day surgery and diagnosis are growing trends in healthcare, including urological care [13]. Findings from this study revealed that one-quarter of admissions to the urological department were one-day hospitalizations. This observation suggests that one-day hospitalizations are a significant part of urological care and may contribute to increasing the effectiveness of healthcare in Poland. Moreover, most of the urological hospitalizations ended within 3 days, but almost one-quarter of patients were hospitalized for 4 days or more. Over half of males admitted due to prostate cancer were hospitalized for 4 days and over. This observation suggests that particular attention should be paid to the quality of urological care of patients with prostate cancer and the development of novel techniques and surgical methods that may shorten the duration of hospitalization [30]. There were only 716 in-hos-

pital deaths (0.3% of all urological hospitalizations) which suggests that the safety of procedures provided in urological departments is high and patients admitted to urological departments are in general good condition.

Data used in this study were collected as a part of public statistics and aggregated into a nationwide registry. Previously published data based on the same registry indicated that physicians performing one-day surgical procedures (e.g., ophthalmologists taking care of patients with cataracts) miss comorbidities in discharge records [21]. Findings from this registry-based study revealed that 16.7% of patients admitted to the urological departments had comorbidities, which is lower than the prevalence of comorbidities in a general population (up to 50% of the population) [31]. This observation suggests that urologists did not follow guidelines on data reporting on comorbidities of patients admitted to urological departments, especially patients admitted for one-day surgeries.

Table 5. Epidemiological characteristics of patients admitted to urological departments due to bladder cancer, kidney and ureteral stones or uropathy in Poland in 2022

Variable	Cause of admission to urological department					
	bladder cancer (C67) n = 32553		kidney and ureteral stones (N20) n = 42504		obstructive and reflux uropathy (N13) n = 20975	
	n	%	n	%	n	%
Gender						
male	24346	74.8	24308	57.2	10040	47.9
female	8207	25.2	18196	42.8	10935	52.1
Age						
mean \pm SD; median; min–max	70.2 \pm 9.5		54.4 \pm 15.1		60.4 \pm 16.2	
median; min–max	70; 18–99		56; 18–98		64; 18–104	
Type of admission						
emergency	3227	9.9	9994	23.5	6423	30.6
scheduled	29326	90.1	32510	76.5	14552	69.4
Duration of hospitalization						
mean \pm SD	3.0 \pm 4.4		2.6 \pm 2.7		2.8 \pm 3.7	
median; min–max	2; 0–275		2; 0–98		2; 0–140	
<24 hours	5685	17.5	9993	23.5	5864	28.0
1 day	2191	6.7	3179	7.5	2294	10.9
2 days	12553	38.6	12719	29.9	4336	20.7
3 days	4468	13.7	6422	15.1	2623	12.5
4 days or more	7656	23.5	10191	24.0	5858	27.9
In-hospital death						
yes	159	0.5	28	0.1	100	0.5
no	32394	95.5	42476	99.9	20875	99.5
Number of hospital wards						
1	32185	98.9	42363	99.7	20804	99.2
2 or more	368	1.1	141	0.3	171	0.8
Data on comorbidities reported in the registry						
yes	4906	15.1	5315	12.5	4820	23.0
no	27647	84.9	37189	87.5	16155	77.0

n – number of patients; SD – standard deviation

Table 6. Epidemiological characteristics of males admitted to urological departments due to prostate diseases in Poland in 2022

Variable	Cause of admission to urological department			
	prostate cancer (C61) n = 13123		hyperplasia of prostate (N40) n = 21382	
	n	%	n	%
Age				
mean \pm SD	67.3 \pm 7.3		69.4 \pm 8.2	
median; min-max	67; 29-98		70; 20-99	
Type of admission				
emergency	1111	8.5	1546	7.2
scheduled	12012	91.5	19836	92.8
Duration of hospitalization				
mean \pm SD	4.0 \pm 3.7		2.9 \pm 3.1	
median; min-max	4; 0-121		2; 0-120	
<24 hours	2488	19.0	6318	29.5
1 day	445	3.4	1248	5.8
2 days	828	6.3	3307	15.5
3 days	2466	18.8	3516	16.4
4 days or more	6896	52.5	6993	32.7
Outcome of hospitalization				
In-hospital death				
yes	30	0.2	8	0.0
no	13093	99.8	21374	99.9
Number of hospital wards				
1	13011	99.1	21318	99.7
2 or more	112	0.9	64	0.3
Presence of comorbidities according to discharge card				
yes	1651	12.6	3639	17.0
no	11472	87.4	17743	83.0

n – number of patients; SD – standard deviation

Practical implications

Findings from this study provide precise epidemiological data on inpatient urological care in Poland. Demographic characteristics of patients hospitalized in urological departments may be used to forecast further needs for urological care for the elderly population. Data on the duration of hospitalization and outcomes of hospitalization may be used by urologists and policymakers to evaluate the current quality of urological care in Poland. Regional differences in urological hospitalizations presented in this study point out an urgent need to remove barriers to access to urological procedures. Moreover, findings from this study suggest that data reporting should be improved and there is a need

to educate urologists on the importance of public statistics and data reporting (especially those related to medical history and comorbidities) that pose a basis for policymaking. Data presented in this study may be also used for comparisons between urological departments and benchmarking related to the demographic characteristics of the patients, duration of care, and its outcome.

This is a registry-based study, and the scope of analysis is limited to data available in datasets collected within the nationwide registry. Data on procedures performed during the hospitalization were not available, so the impact of surgical techniques on the outcomes of hospitalizations was not analyzed. Datasets were anonymous, so patients re-hospitalized after 30 days from the first admission cannot be identified. Data on comorbidities should be analyzed carefully, as the low prevalence of comorbidities presented in this study may result from the insufficient attention paid to the data coding (mostly in patients admitted to one-day surgical procedures) by physicians rather than the health status of the population.

CONCLUSIONS

This study revealed that most of the patients admitted to urological departments were males and the significant peak in hospital admissions was observed after 60 years of age. Significant regional differences in the hospitalization rates in urological departments were observed. Almost every fourth patient admitted to the urological department was discharged within 24 hours. Kidney and ureteral stones, bladder cancer, and prostate hyperplasia were the most common causes of hospital admissions. Data presented in this study may be used by physicians and policymakers to evaluate and improve inpatient urological care in Poland (especially access to healthcare services and quality of data reporting) and forecast demand for urological care.

ACKNOWLEDGEMENTS

We are grateful to the Department of Population Health Monitoring and Analysis, Nationwide Institute of Public Health NIH – Nationwide Research Institute in Warsaw for data sharing.

CONFLICT OF INTERESTS

Authors declare no conflict of interest.

References

1. Lang J, Narendrula A, El-Zawahry A, Sindhwani P, Ekwenna O. Global Trends in Incidence and Burden of Urolithiasis from 1990 to 2019: An Analysis of Global Burden of Disease Study Data. *Eur Urol Open Sci.* 2022; 35: 37-46.
2. Öztürk R, Murt A. Epidemiology of urological infections: a global burden. *World J Urol.* 2020; 38: 2669-2679.
3. Tian YQ, Yang JC, Hu JJ, Ding R, Ye DW, Shang JW. Trends and risk factors of global incidence, mortality, and disability of genitourinary cancers from 1990 to 2019: Systematic analysis for the Global Burden of Disease Study 2019. *Front Public Health.* 2023; 11: 1119374.
4. GBD 2019 Benign Prostatic Hyperplasia Collaborators. The global, regional, and national burden of benign prostatic hyperplasia in 204 countries and territories from 2000 to 2019: a systematic analysis for the Global Burden of Disease Study 2019. *Lancet Healthy Longev.* 2022; 3: e754-e776.
5. Zi H, He SH, Leng XY, et al. Global, regional, and national burden of kidney, bladder, and prostate cancers and their attributable risk factors, 1990-2019. *Mil Med Res.* 2021; 8: 60.
6. Heldwein FL, Loeb S, Wroclawski ML, et al. A Systematic Review on Guidelines and Recommendations for Urology Standard of Care During the COVID-19 Pandemic. *Eur Urol Focus* 2020; 6: 1070-1085.
7. Supreme Medical Chamber of the Republic of Poland. Statistical information. Available online: <https://nil.org.pl/rejestr/centralny-rejestr-lekarzy/informacje-statystyczne> (accessed on January 19, 2024).
8. Zgliczyński WS, Jankowski M, Rostkowska O, et al. Public and private health care services in the opinion of physicians in Poland. *Int J Occup Med Environ Health.* 2020; 33: 195-214.
9. Sagan A, Panteli D, Borkowski W, et al. Poland health system review. *Health Syst Transit.* 2011; 13: 1-193.
10. Healthcare facilities dataset. Urology. Available online: <https://swiatprzychodni.pl/specjalnosci/urolog/> (accessed on: January 19, 2024).
11. Srinivasan A, Wang R. An Update on Minimally Invasive Surgery for Benign Prostatic Hyperplasia: Techniques, Risks, and Efficacy. *World J Mens Health.* 2020; 38: 402-411.
12. Amparore D, Campi R, Checcucci E, et al. Forecasting the Future of Urology Practice: A Comprehensive Review of the Recommendations by International and European Associations on Priority Procedures During the COVID-19 Pandemic. *Eur Urol Focus.* 2020; 6: 1032-1048.
13. Ambusaidi H, Alshuaibi MK, Colau A, Dominique I, Mouton M, Sebe P. Day of surgery admission in urology: Patient criteria and the organization required for same-day admission in urology: A retrospective study. *Urol Ann.* 2023; 15: 368-372.
14. Ratajczak JM, Gawrońska A, Fischer M, Hladun T, Marczak M. Can We Identify Patients in Danger of Delayed Treatment? Management of COVID-19 Pandemic Backlog in Urology Care in Poland. *Int J Environ Res Public Health.* 2022; 19: 16547.
15. Antoniewicz AA, Niemczyk W, Regulski PA, Niezgodka M. The impact of the COVID-19 pandemic on urological care in Poland - Post-COVID resilience scenarios and recommendations for healthcare system: A national population-based modelling study. *Archives of Medical Science.* 2021. doi:10.5114/aoms/144310.
16. Rajwa P, Przydacz M, Krajewski W, et al. Changing patterns of urologic emergency visits and admissions during the COVID-19 pandemic: a retrospective, multicenter, nationwide study. *Arch Med Sci.* 2020; 17: 1262-1276.
17. Poznańska A, Goryński P, Seroka W, Stokwiszewski J, Radomski P, Wojtyniak B. Nationwide General Hospital Morbidity Study as a source of data about Polish population health. *Przegl Epidemiol.* 2019; 73: 69-80.
18. World Health Organization (WHO). ICD-10 Version: 2010. Available online: <https://icd.who.int/browse10/2010/en> (accessed on January 19, 2024).
19. Ordinance of the Ministry of Health on May 17, 2012 on the system of departmental identification codes and the detailed method of assigning them. *Polish Journal of Laws*, 2019, item 173.
20. Kanecki K, Nitsch-Osuch A, Goryński P, et al. Hospitalizations for COVID-19 in Poland: a study based on data from a national hospital register. *Pol Arch Intern Med.* 2021; 131: 535-540.
21. Kamińska A, Pinkas J, Goryński P, Jankowski M. A National Registry-Based Epidemiological Study to Evaluate 395 646 Patients Hospitalized Due to Eye Diseases in Poland in 2019. *Med Sci Monit.* 2023; 29: e939351.
22. Statistics of Poland. Statistical Yearbooks. Demographic Yearbook of Poland 2022. Available online: <https://stat.gov.pl/en/topics/statistical-yearbooks/statistical-yearbooks/demographic-yearbook-of-poland-2022,3,16.html> (accessed on January 19, 2024).
23. Regulation of the Council of Ministers of 25 March 2022 on establishing specific restrictions, orders, and prohibitions in relation to the state of epidemic. *Polish Journal of Laws*, 2022, item 673.
24. Ufuah S, Tallman JE, Moses KA. The Pursuit of Health Equity and Equality in Urologic Oncology: Where We Have Been and Where We Are Going. *Eur Urol Focus.* 2021; 7: 929-936.
25. Deltourbe L, Lacerda Mariano L, Hreha TN, Hunstad DA, Ingersoll MA. The impact of biological sex on diseases of the urinary tract. *Mucosal Immunol.* 2022; 15: 857-866.
26. Doshi B, Athans SR, Woloszyńska A. Biological differences underlying sex and gender disparities in bladder cancer: current synopsis and future directions. *Oncogenesis.* 2023; 12: 44.
27. Seitz C, Fajkovic H. Epidemiological gender-specific aspects in urolithiasis. *World J Urol.* 2013; 31: 1087-1092.
28. Faure Walker N, Gill B, Olsburgh J, et al. Age-related urologic problems in the complex urologic patient. *World J Urol.* 2021; 39: 1037-1044.
29. Welén K, Damber JE. Androgens, aging, and prostate health. *Rev Endocr Metab Disord.* 2022; 23: 1221-1231.
30. Gandaglia G, Schatteman P, De Naeyer G, D'Hondt F, Mottrie A. Novel Technologies in Urologic Surgery: a Rapidly Changing Scenario. *Curr Urol Rep.* 2016; 17: 19.
31. Gańczak M, Miazgowski T, Kozybska M, et al. Changes in disease burden in Poland between 1990-2017 in comparison with other Central European countries: A systematic analysis for the Global Burden of Disease Study 2017. *PLoS One.* 2020; 15: e0226766. ■