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Regional Inequalities in Primary Healthcare Access in Poland: Evidence from Patient Registration Data

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Abstract

Primary healthcare (PHC) is a key component of the healthcare system and plays a central role in ensuring access to basic health services. Therefore, this study assesses regional differences in access to PHC services in Poland, based on patient registration data published by the National Health Fund. This study is a cross-sectional secondary analysis of National Health Fund data on the number of patients registered to particular primary care physicians and nurses as of December 2024. Data are presented for all voivodeships in Poland.

Overall, PHC coverage reached 91.0% for physicians and 87.1% for nurses, with lower nurse coverage in Opole (72.7%) and Greater Poland (80.0%). The nurse–physician gap varied across regions, ranging from −0.5% in Kuyavia-Pomerania to 14.9% in Greater Poland. PHC services were highly concentrated, with large and very large providers (≥6,000 patients per facility) accounting for 30% of facilities but serving 60% of patients. The highest proportion of patients registered with large providers was observed in the Pomeranian (74.7%) and Mazovian (71.9%) voivodeships, while the lowest was in the Lublin (41.3%) and Podlaskie (42.4%) voivodeships. Individual providers accounted for less than 1% of total registrations, although the largest providers were mainly located in the Mazovian voivodeship.

Findings from this study indicate significant regional inequalities in access to PHC services in Poland, particularly in the distribution of nursing care and the concentration of services in larger providers.

Keywords: primary healthcare; access; inequalities; Poland; health services; workforce

Introduction

Primary healthcare (PHC) is a key part of the healthcare system in Poland. Access to basic healthcare services is delivered through patients registering with a particular family doctor, nurse, and midwife (Sowada et al., 2019). PHC is often the first contact point for patients seeking medical services (Marcinowicz et al., 2008; Krztoń-Królewiecka et al., 2020). Primary care physicians act as "gatekeepers" who refer patients to specialist care or hospital treatment (Sripa et al., 2019).

In Poland, the healthcare system is based on mandatory health insurance (Sowada et al., 2019). Each insured individual has the right to choose a primary care facility, including a primary care physician and a nurse. Women may also choose a midwife providing primary care services (Act of 27 October 2017 on Primary Healthcare, 2017).

PHC in Poland operates under a declarative system, where patients declare their choice of doctor and nurse (Act of 27 October 2017 on Primary Healthcare, 2017). These registrations are used to organize care and financing and can be considered to approximate the number of people covered by the primary healthcare system (Sowada et al., 2019). However, this system is not mandatory, meaning that the coverage for primary healthcare declarations is less than 100%.

Patients can change their primary healthcare doctor, nurse, or midwife twice a year free of charge. Funding for primary healthcare services is primarily based on a capitation rate, i.e., a lump sum paid to the provider for each patient registered to them (Act of 27 October 2017 on Primary Healthcare, 2017). This means that the amount of funding depends on the number of people receiving care, not the number of services provided, which is intended to ensure continuity and comprehensive care.

Primary healthcare provides basic health services, including prevention, diagnosis, and treatment of the most common diseases, as well as prescribing medications – particularly for the continuation of treatment (Zakrzewska et al., 2017; Krztoń-Królewiecka et al., 2020; Grudziąż-Sękowska et al., 2025). It also includes care for patients with chronic conditions, referrals for further diagnostics, and preventive measures, including vaccinations (Guziak et al., 2025).

Patients often choose primary care facilities located near their place of residence (Lechowski and Jasion, 2021). The location of primary healthcare facilities near areas with high population density, such as housing developments or densely built areas, is one of the key factors influencing the availability of PHC providers (Krztoń-Królewiecka et al., 2020; Lechowski and Jasion, 2021). Despite widespread access to PHC, concerns regarding inequalities in access to primary care services in Poland persist (Lechowski and Jasion, 2021). These differences may relate to the availability of service providers, the size of facilities, and the ratio of registered patients to doctors and nurses, which reflects differences in the organization of PHC services.

These inequalities can lead to differences in actual access to primary care services, despite formally high levels of population coverage. In particular, the concentration of services in larger entities and differences in the availability of medical personnel can impact the quality and continuity of care (Nessler et al., 2022).

In the context of an aging population and growing demand for healthcare services, analyzing inequalities in the primary healthcare system is particularly important (Zakrzewski et al., 2025). Therefore, this study aims to identify any regional differences in access to primary care services based on patient registration data published by the National Health Fund (*NFZ*), with a particular emphasis on the population coverage, the ratio of patients to doctors and nurses, and the concentration of services in facilities of various sizes.

Material and methods

A secondary analysis was conducted using publicly available registry data from Poland's National Health Fund (2025) as of December 2024. The analysis included the number of declarations submitted to general practitioners and nurses in PHC from individuals identified by a unique personal identification number (PESEL). Using the national identification numbers reduces the risk of double-counting individuals within a single provider. Declarations submitted to midwives were excluded due to their different role in PHC services and lower comparability with declarations for physician and nurse.

The dataset is aggregated at the level of PHC providers and includes the number of patients assigned to each provider within the declaration-based system. The data are cross-sectional and refer to a single time-point (December 2024). Data on population size and demographics (including age distribution) were obtained from the Demographic Yearbook 2025, published by Statistics Poland (*GUS*; Statistics Poland, 2025), which provides population data as of 31 December 2024.

Data analysis was conducted using Microsoft Excel. Descriptive statistics were applied, including counts, proportions, and calculated indicators. All indicators were calculated using data aggregated at the voivodeship or provider level. All measures were used to assess regional variation, service concentration, and structural inequalities in the organization of PHC services.

PHC coverage rates were calculated as the ratio of the number of patient registrations to the total population in each voivodeship, using population data from Statistics Poland. The resulting values were interpreted as a proxy measure of population coverage by primary healthcare services, expressed as percentages. These indicators were constructed to enable a standardized comparison of access to different types of PHC providers across regions.

The size of primary healthcare (PHC) providers was defined according to the number of patients assigned to physicians at each provider, reflecting the level of service delivery. Providers were grouped into five categories: very small (<1,500 patients), small (1,500–2,999), medium (3,000–5,999), large (6,000–9,999), and very large (≥10,000 patients). The thresholds were based on the distribution of patient loads and they reflect the operational differences between providers.

The relative gap (in percent) was calculated as the difference between registrations for physician and for nurse per 1,000 population divided by registrations for physician per 1,000 population, expressed as a percentage.

The shares of large providers and of patients treated by large providers were calculated to assess the concentration of PHC services.

PHC providers were ranked based on the number of patients who selected them as their primary care physician (registrations for physician). The share of the national total was calculated separately for registrations for physician and for nurse, based on the total number of registrations nationwide.

Results

Table 1 presents the distribution of PHC registrations and providers across voivodeships in Poland. In total, 34.4 million registrations for physician and 32.9 million for nurse were recorded. The highest numbers of patients were observed in the Mazovian and Silesian voivodeships, followed by Greater Poland and Lesser Poland, while the lowest numbers were observed in the Opole and Lubusz voivodeships (Table 1).

Table 1. Number of patient registrations (for physician and nurse) and PHC providers in Poland, by voivodeship, as of December 2024

Voivodeship	Number of patients (physician)	Number of patients (nurse)	Number of PHC providers
Lower Silesian	2,612,982	2,573,469	500
Kuyavian-Pomeranian	1,799,620	1,807,877	326
Lublin	1,827,136	1,812,222	448
Lubusz	879,043	835,874	229
Łódź	2,246,670	2,248,608	441
Lesser Poland	3,163,185	2,887,351	570
Mazovian	5,172,651	5,147,493	703
Opole	800,333	688,155	198
Subcarpathian	1,830,206	1,644,669	503
Podlaskie	1,007,062	994,489	258

Voivodeship	Number of patients (physician)	Number of patients (nurse)	Number of PHC providers
Pomeranian	2,169,313	2,033,548	352
Silesian	3,968,727	3,897,191	756
Świętokrzyskie	1,035,563	1,002,318	224
Warmian-Masurian	1,175,237	1,135,319	316
Greater Poland	3,286,690	2,797,826	933
West Pomeranian	1,451,908	1,426,902	309
Total	34,426,326	32,933,311	7,066

Table 2 presents the coverage of PHC registrations across voivodeships in Poland. Overall, coverage reached 91.0% for registrations for physician and 87.1% for nurse. Physician coverage was relatively consistent across regions, ranging from 84.5% to 94.0%, whereas nurse coverage showed greater variability, from 72.7% to 94.0% (Table 2).

The highest coverage rates for both physician and nurse were observed in the Łódź and Mazovian voivodeships, while the lowest physician coverage was recorded in the Warmian-Masurian and Opole voivodeships and the lowest nurse coverage was in Opole and Greater Poland (Table 2).

Table 2. Coverage of PHC registrations (for physician and nurse) in Poland, by voivodeship, as of December 2024

Voivodeship	PHC physician coverage (%)	PHC nurse coverage (%)
Lower Silesian	90.5%	89.1%
Kuyavian-Pomeranian	90.5%	90.9%
Lublin	89.8%	89.1%
Lubusz	89.3%	84.9%
Łódź	93.9%	94.0%
Lesser Poland	92.5%	84.4%
Mazovian	93.6%	93.2%
Opole	84.6%	72.7%
Subcarpathian	87.4%	78.5%
Podlaskie	87.9%	86.8%
Pomeranian	91.9%	86.2%
Silesian	90.9%	89.3%
Świętokrzyskie	87.2%	84.4%
Warmian-Masurian	84.5%	81.6%
Greater Poland	94.0%	80.0%
West Pomeranian	86.0%	84.5%
Total	91.0%	87.1%

Table 3 presents PHC registrations per 1,000 population and the nurse–physician gap across voivodeships. Nationwide, values reached 910 per 1,000 for physician and 871 for nurse, with an overall gap of 4.3%. The nurse–physician gap ranged from a near balance in the Łódź (–0.1%) and Kuyavian-Pomeranian (–0.5%) voivodeships to marked disparities in Greater Poland (14.9%) and the Opole (14.0%) and Subcarpathian (10.1%) voivodeships (Table 3).

Table 3. PHC declarations per 1,000 population and the nurse–physician gap, by voivodeship, as of 2024

Voivodeship	Registrations for physician (per 1,000 population)	Registrations for nurse (per 1,000 population)	Gap (%)
Lower Silesian	904.8	891.1	1.5%
Kuyavian-Pomeranian	904.8	908.9	-0.5%
Lublin	898.3	891.0	0.8%
Lubusz	893.3	849.5	4.9%
Łódź	939.2	940.1	-0.1%
Lesser Poland	924.9	844.3	8.7%
Mazovian	936.2	931.7	0.5%
Opole	846.0	727.4	14.0%
Subcarpathian	874.0	785.4	10.1%
Podlaskie	878.8	867.8	1.2%
Pomeranian	919.2	861.7	6.3%
Silesian	909.0	892.6	1.8%
Świętokrzyskie	871.7	843.7	3.2%
Warmian-Masurian	844.9	816.2	3.4%
Greater Poland	939.9	800.1	14.9%
West Pomeranian	860.1	845.3	1.7%
Total	910.0	871.0	4.3%

Table 4 shows that while most PHC providers are small (1,500–2,999 patients) or medium (3,000–5,999 patients) (Table 4), patient registrations are concentrated in large (6,000–9,999 patients) and very large (≥10,000 patients) facilities (Table 4).

Table 4. Distribution of PHC facilities and patient registrations by facility size in Poland, December 2024

Facility size	Number of PHC providers	Registrations for physician	Registrations for nurse
Very small (<1,500 patients)	531	529,249	421,051
Small (1,500–2,999 patients)	1,563	3,557,157	2,976,991
Medium (3,000–5,999 patients)	2,153	9,319,921	7,834,610
Large (6,000–9,999 patients)	1,083	8,287,774	6,655,800
Very large (≥10,000 patients)	699	12,732,225	10,888,234

Table 5 presents the concentration of PHC services in large (6,000–9,999 patients) and very large (≥10,000 patients) providers across voivodeships. Nationally, these providers account for 30.0% of facilities but serve 60.0% of patients. Regional variation is substantial, with the highest patient concentration being observed in the Pomeranian (74.7%) and Mazovian (71.9%) voivodeships and the lowest in the Lublin (41.3%) and Podlaskie (42.4%) voivodeships (Table 5).

Table 5. Concentration of PHC services in large and very large providers by voivodeship, as of 2024

Voivodeship	Percentage of large and very large providers	Percentage of patients registered with large and very large providers
Lower Silesian	26.9%	62.5%
Kuyavian-Pomeranian	36.0%	65.3%
Lublin	18.8%	41.3%
Lubusz	24.7%	52.3%
Łódź	25.8%	56.4%
Lesser Poland	38.3%	68.0%
Mazovian	34.8%	71.9%
Opole	21.7%	52.8%
Subcarpathian	29.1%	59.5%
Podlaskie	17.8%	42.4%
Pomeranian	37.6%	74.7%
Silesian	32.3%	58.9%
Świętokrzyskie	33.1%	60.3%
Warmian-Masurian	21.6%	48.4%
Greater Poland	30.1%	57.7%
West Pomeranian	27.3%	60.3%
Total	30.0%	60.0%

Table 6 presents the largest PHC providers according to the number of registered patients. Each provider accounts for less than 1% of total registrations, with the largest entity (LUX MED, Mazovian) reaching 0.74%. Most of the top providers are located in the Mazovian voivodeship, indicating a strong geographic concentration (Table 6).

Table 6. Top 10 largest PHC providers by number of registered patients, as of December 2024

Rank	Provider	Voivodeship	Registrations for physician	Registrations for nurse	Share of total registrations for physician (%)	Share of total registrations for nurse (%)
1	LUX MED Sp. z o.o.	Mazovian	254,881	243,134	0.74%	0.74%
2	Centrum Medyczne Puławska Sp. z o.o.	Mazovian	127,821	127,540	0.37%	0.39%
3	Nadmorskie Centrum Medyczne Sp. z o.o.	Pomeranian	102,950	84,009	0.30%	0.26%
4	LUX MED Sp. z o.o.	Lesser Poland	99,827	77,614	0.29%	0.24%
5	Centrum Medyczno-Diagnostyczne Sp. z o.o.	Mazovian	96,878	96,751	0.28%	0.29%
6	NZOZ Kraków-Południe Sp. z o.o.	Lesser Poland	93,963	95,258	0.27%	0.29%
7	SPZZLO Warszawa Żoliborz-Bielany	Mazovian	89,035	88,208	0.26%	0.27%
8	Grupa Zdrowie Sp. z o.o.	Mazovian	88,979	89,368	0.26%	0.27%
9	ZOZ Warszawa Bemowo-Włochy	Mazovian	86,366	87,199	0.25%	0.26%
10	SPZOZ Warszawa Wola–Śródmieście	Mazovian	78,459	79,333	0.23%	0.24%

Discussion

This study provides a comprehensive analysis of the regional variation in how PHC is organized in Poland, based on patient registration data. The findings from this study confirmed good coverage of the population with PHC services, but also identified regional inequalities. Variations in coverage with primary care nurse services were the most pronounced. The study also showed a high concentration of large PHC providers being selected for primary care services.

In Poland, all insured individuals have access to health services provided within the public healthcare system (Act of 27 October 2017 on Primary Healthcare, 2017; Sowada et al., 2019). Providing access to primary care services is a key element of the universal health coverage recommended by the World Health Organization (Collins et al., 2023). In this study, the highest number of PHC registrations was observed in the Mazovian and Silesian voivodeships – the two most populous and urbanized regions in Poland. In contrast,

the fewest PHC registrations were observed in the Lubusz and Opole voivodeships, those with the fewest inhabitants. This observation reflects the demographic distribution of the population across regions (voivodeships). The highest number of PHC facilities was in Greater Poland (933). Despite having fewer registrations than the Mazovian and Silesian voivodeships, Greater Poland has the most PHC providers.

Each insured individual can choose a primary care provider and declare a specific primary care physician and nurse, from whom they receive care (Act of 27 October 2017 on Primary Healthcare, 2017; Sowada et al., 2019). Utilizing primary care is voluntary, though PHC serves as the first point of contact for obtaining prescriptions and sick leave, which results in a high proportion of the population registering with PHC providers.

Although overall coverage of PHC registrations was high (91.0% for physician and 87.1% for nurse), the observed regional variation in coverage – particularly in registrations for nurse (ranging from 72.7% in Opole to 94.0% in Łódź) – suggests that access to different components of PHC may be uneven. The lower nurse coverage in regions such as Opole (72.7%) and Greater Poland (80.0%) may indicate limited availability of nursing staff or differences in organizational models of care. The findings from this study indicate a nurse–physician imbalance across regions (Statistics Poland, 2025). While some voivodeships showed minimal differences, such as the Łódź (–0.1%) and Kuyavian-Pomeranian (–0.5%) voivodeships, others exhibited substantial gaps exceeding 10%, particularly in Greater Poland (14.9%) and the Opole (14.0%) and Subcarpathian (10.1%) voivodeships. This imbalance may reflect structural differences in the composition of PHC teams or potential shortages of nursing staff. Given the important role of nurses in chronic disease management and continuity of PHC services, such disparities may have implications for both quality and efficiency of care delivery (Lechowski and Jasion, 2021). This imbalance may also reflect differences in organizational models of care, patient preferences, and regional variation in workforce availability, particularly shortages of nursing staff.

In this study, the size of PHC facilities was also analyzed, revealing a pronounced concentration of PHC services among large and very large providers (30% of facilities serving approximately 60% of patients nationwide). While this may improve efficiency, it may also limit accessibility in some areas, particularly in less densely populated areas. Regional differences were evident, with higher concentrations in the Pomorskie (74.7%) and Mazovian (71.9%) voivodeships and lower concentrations in eastern regions such as the Lublin (41.3%) and Podlaskie (42.4%) voivodeships. Although most providers were small or medium-sized, patients were predominantly registered with larger providers, indicating a structural imbalance. At the same time, individual providers accounted for less than 1% of total registrations, suggesting a low concentration at the single-provider level, but a broader geographical centralization of services – particularly in the Mazovian voivodeship. This may increase patient load per provider and negatively affect continuity and quality of care.

This study has several practical implications. Firstly, it revealed a nurse–physician imbalance across the regions. This observation suggests that there is a need to strengthen nursing care within primary care services. Regional-level activities are needed to increase the number of nurses in primary care facilities. Secondly, it indicated regions that should actively work on expanding access to primary care services. Thirdly, it revealed that PHC services are concentrated among large and very large providers. This observation may lead to changes in how primary care services are organized in Poland. The concentration of very large providers in the Mazovian voivodeship suggests a geographic centralization of high-capacity services, which may further contribute to regional inequalities.

This study has several limitations. Firstly, it is based on administrative registry data and does not capture utilization or quality of services. Secondly, the cross-sectional design prevents causal inference. Thirdly, the analysis was conducted at the voivodeship level, which may mask intra-regional inequalities. Finally, PHC coverage based on patient registration may slightly overestimate actual access to services.

Conclusions

The study demonstrates that, despite high overall coverage of PHC registration in Poland, significant regional inequalities persist in access to primary care services. These disparities are reflected in the imbalance between registrations for physician and for nurse and in the concentration of patients registered with larger providers. Addressing these structural differences, particularly between registrations for physician and for nurse and in regional accessibility, is essential to ensure equitable and effective primary healthcare.

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