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The Significance of Effective Distribution Logistics in Ensuring Equal Access to Medicinal Products in Poland

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Emil Ratter[1], Magdalena Kalbarczyk[2], Małgorzata Orłowska[3], Krzysztof Dzięgielewski[4]

Abstract:

Purpose: *The distribution of pharmaceuticals plays a crucial yet often underappreciated role in the healthcare system, forming an integral part of the supply chain that directly impacts patient health, lives, and public safety. An efficiently functioning pharmaceutical distribution system is essential not only for eliminating delays in access to medications but also for ensuring continuity of treatment and minimizing epidemiological risks. This article focuses on the current logistical challenges and solutions that can support drug distribution.*
Design/Methodology/Approach: *The main objective of the research is to highlight the role of distribution logistics in ensuring equal access to medicinal products in Poland, with particular emphasis on contemporary challenges and logistical solutions affecting drug distribution in smaller urban centres and rural areas. The theoretical and cognitive goal is a comprehensive review of the relevant literature, legal acts, and scientific studies related to the subject matter. The article utilizes literature analysis, case studies, and empirical data from industry reports (such as those from the Central Statistical Office, IQVIA, PMR, Pharmaceutical Race of Nations, and Pharmaceutical Market – New Opening as well as personal observations. The research confirmed that effective logistics, based on modern distribution channels, is a key factor influencing equality in access to medicinal products. This has significant implications for public health, health security stability, and the economic development of local areas.*
Findings: *The analysis presented in the article highlights the logistical challenges that limit equal access to medications in Poland and disrupt the efficient functioning of supply chains. It also outlines potential development perspectives for pharmaceutical distribution in the context of improving the availability of medicinal products.*
Practical implications: *The outcome of conceptual work includes proposals for changing the functioning of contemporary distribution models, which can be utilized by policymakers, legislative authorities, and representatives of institutions responsible for shaping*

[1]*Warsaw Management University, Poland, ORCID: 0000-0001-8872-3286, e-mail: em.ratter@gmail.com;*
[2]*WSB Merito University in Warsaw, Poland, ORCID: 0000-0002-8941-8432, e-mail: magdalena.kalbarczyk99@gmail.com;*
[3]*War Studies University, Warsaw, Poland, ORCID: 0000-0002-8446-8764, e-mail: m.orlowska@akademia.mil.pl;*
[4]*Advocate, Warsaw, Poland, e-mail: krzysztof.dziegielewski@adwokatura.pl;*

pharmaceutical policy and the healthcare system in Poland to improve regulations concerning pharmaceutical distribution.
Originality/Value: *The authors present the possibilities of utilizing modern pharmaceutical distribution channels based on advanced technologies such as IoT (Internet of Things), artificial intelligence, and ERP systems, which represent the future of the pharmaceutical sector. Their development can contribute not only to the optimization of drug delivery but also to improving the health security of society as a whole. Poland should strive for the integration of such solutions, which can aid in crisis management, responding to emergencies, and safeguarding public health.*

Keywords: *Logistics, distribution, medicinal products, socio-economic development.*

JEL codes: *I19, H42, O18.*

Paper type: *Research article.*

1. Introduction

Polish pharmaceutical policy is a complex and multifaceted topic that encompasses issues related to access to medications, their reimbursement, safety, and the development of the domestic pharmaceutical industry. One key element of this policy is ensuring that patients have timely access to medicinal products at affordable prices. Like other countries, Poland strives to provide access to modern therapies; however, a frequent challenge in this process is the cost of new, innovative drugs.

The Minister of Health is responsible for decisions regarding which medications will be included on the reimbursement list, directly impacting their availability (Nowicki, Czarnecka-Operacz, Grubska-Suchanek *et al.*, 2024). The drug reimbursement system helps reduce treatment costs for patients. The Ministry of Health regularly updates the list of reimbursed medications. In 2021, the so-called "Medical Fund" was introduced to support access to innovative oncological therapies and treatments for rare diseases (Barszczewska, 2023).

A key element of drug policy is ensuring the safety of pharmacotherapy, which involves the appropriate and safe use of medications for patients. The responsibilities of the Chief Pharmaceutical Inspectorate include monitoring the quality of drugs available on the market and ensuring compliance with regulations.

Additionally, numerous programs for monitoring adverse drug reactions are periodically implemented to minimize risks for patients. Drug policy also encompasses actions related to innovation, research on new medications, and the production of active pharmaceutical ingredients.

The development of the domestic pharmaceutical industry is also a matter of drug safety for the state—especially in the context of the SARS-CoV-2 pandemic, which highlighted the importance of self-sufficient drug production within the country.

Poland's drug policy aims to ensure that drug prices are aligned with the financial capabilities of patients and the state budget (Serwis Rzeczypospolitej Polskiej, 2018). Therefore, price negotiations with pharmaceutical companies regarding reimbursement help reduce the costs of medications, particularly modern ones (Motyl, 2024). Furthermore, actions are being taken in Poland to increase patient awareness about the rational use of medications, especially concerning antibiotics, the excessive use of which leads to the development of microbial resistance. Informational campaigns and educational programs promote safe and informed medication use (Kołodziejek, 2023; Fernando *et al.*, 2023).

The pharmaceutical distribution sector in Poland has been facing challenges since the SARS-CoV-2 pandemic, including disrupted supply chains and a lack of availability of certain medications from manufacturers, driven by the global economic and geopolitical situation. This unavailability translates into patients' inability to purchase necessary medications. Therefore, the construction and development of modern distribution channels present an opportunity not only to improve the accessibility of medicines in Poland but also to reduce delivery costs for patients.

2. Drug Policy in Poland

The World Health Organization (WHO) has mandated UN member states to develop strategic goals related to the management of medications within their territories by presenting comprehensive pharmaceutical policies. These policies should address, equal availability and affordability of essential medicines, principles concerning the quality, safety, and efficacy of drugs entering the market, and the promotion of cost-effective use of medications by healthcare professionals and patients (World Health Organization, 2001).

To this end, the Minister of Health established a team responsible for developing the national pharmaceutical policy framework, which culminated in a strategic document entitled "National Pharmaceutical Policy 2018-2022," prepared at the end of 2017. This document outlines the priorities for the Polish government's actions regarding medication management in collaboration with the medical and pharmaceutical sectors. It states that "effective, safe, and rational pharmacotherapy is one of the foundations of an efficient healthcare system" (Ministry of Health, 2018).

Pharmacotherapy requires special attention from government institutions due to its significant importance for the life and health of patients. "Poland can significantly better utilize its potential in the area of clinical research, ensure more efficient

pharmaceutical distribution, which currently struggles with phenomena such as the reversed supply chain, or the export of medications in situations where there is a risk of unavailability for patients in Poland, and strengthen pharmaceutical supervision, which is expected to take corrective actions."

The reversed supply chain refers to an illegal practice employed by entrepreneurs (sometimes by so-called "white-collar" workers) to unlawfully acquire medicinal products for export purposes. The mechanism involves pharmacies and wholesalers illegally obtaining products (especially those in short supply), which instead of reaching Polish patients, are sent to organized groups exporting drugs abroad.

The State Drug Policy discusses strategic objectives related to pharmaceutical distribution among its six chapters, which cover vaccination, information systems, market and reimbursement availability, and collaboration from medical personnel. It emphasizes that "an efficiently functioning pharmaceutical distribution chain is a prerequisite for ensuring the physical availability of medicinal products."

The Ministry of Health has focused on combating "reverse distribution chains" and the necessity of reporting sales to the Integrated System for Monitoring of Trade of Medicinal Products (ZSMOPL), which serves to monitor the sales process of medicinal products throughout the country. All entities authorized by the Chief Pharmaceutical Inspector to conduct regulated activities regarding the turnover of medicinal products are required to report to this system (Integrated System for the Monitoring of Trade of Medicinal Products, 2024).

Moreover, the actions of the Ministry of Health emphasized improving regulations to ensure full availability of medications in case of shortages, as well as monitoring the transportation of medicinal products. In addition to diagnosing problems, the ministry also outlined the goals it aimed to achieve by 2022 and the necessary tools for implementation, along with metrics for expected outcomes.

Among these goals were increasing the number of inspections conducted, implementing the ZSMOPL system (which indeed occurred in 2019), detecting irregularities in distribution through information systems, and reducing the average duration of drug shortages in pharmacies. Unfortunately, the Ministry of Health did not address accessibility in the State Drug Policy by increasing distribution channels or facilitating access to medications through direct sales (e.g., in *e-commerce*).

In 2017, there was no awareness of the impending SARS-CoV-2 pandemic and its impact on patients' ability to purchase medications (especially seniors), however, the post-pandemic reality necessitated the opening of new distribution channels and illegal online sales of medications outside the established internet pharmacy channel.

The State Drug Policy also defines actions regarding innovation, research on new drugs, and the production of active substances. The development of the domestic

pharmaceutical industry is also a matter of strategic security - especially in the context of the SARS-CoV-2 pandemic, which highlighted the importance of self-sufficient drug manufacturing within the country (Tyagi *et al.,* 2023). Poland's drug policy aims to ensure that drug prices are aligned with the financial capabilities of patients and the state budget.

Therefore, price negotiations with pharmaceutical companies concerning reimbursement help to reduce drug costs, particularly for modern medications. Poland, like other European countries, faces periodic shortages of certain medications due to global supply chain issues and production limitations. Polish patients encounter numerous challenges related to the availability of reimbursed drugs.

Many products are regularly unavailable in Polish pharmacies, leading to health risks for patients with chronic illnesses. Sometimes such situations are temporary (with patients asked to return for their medication the next day), while in other cases, shortages of specific drugs on the market can be prolonged (as seen in recent shortages of diabetes and anticoagulant medications) (Kaczmarczyk, 2022).

Unfortunately, the management of the Ministry of Health has not updated the 'State Drug Policy,' and for nearly two years we have not had an updated document outlining the strategic objectives of the actions of the Polish government, including those related to pharmaceutical distribution and improving patient access to medications.

3. Distribution of Medicinal Products

The word "distribution" originates from the Latin term *distributio*, which means *division* or *allocation of goods.* The concept of distribution involves delivering the right products to end consumers at designated locations, within specified time frames, and at agreed prices. Companies engaged in distribution determine which channels to use and the intensity of their distribution efforts.

Furthermore, they decide on the selection of intermediaries that distribute goods to final consumers. The intensity of distribution is linked to consumer expectations and needs, as well as the type of product being distributed. Based on market demand, products are categorized into three types: common use, selective, and luxury. This classification corresponds to three types of distribution strategies: intensive, selective, and exclusive. A distribution channel refers to the chain of intermediaries (means, institutions, or individuals) through which goods move from the producer to the end consumer (or patient, in the case of pharmaceuticals).

There are two primary types of distribution channels: direct and indirect: A direct channel does not involve intermediaries and connect producers directly with end consumers. When a customer orders a product, the producer may handle production,

storage, assembly, and direct delivery. Conversely, when an intermediary takes ownership or possession of the goods, it is referred to as an indirect channel.

Additionally, channels can be classified based on the number of intermediary levels involved. Short channels have minimal levels e.g., producer - end consumer, while long channels include multiple levels e.g., producer - agent – wholesaler - retailer - end consumer. Another classification is based on channel width, determined by the number of intermediaries at a given level. A narrow channel has few intermediaries, while a wide channel is characterised by a greater number of intermediaries at the same level (Janicki, Nowomiejski, and Rosińska, 2016).

A medicinal product, being a substance or a mixture of substances presented as having properties for preventing or treating diseases occurring in humans or animals, or administered for diagnostic purposes, restoring, improving, or modifying physiological functions of the body through pharmacological, immunological, or metabolic action (Journal of Laws 2024.686) is one of the subjects of pharmaceutical distribution aimed at ensuring equal access to medicines for Polish patients.

A distributor of medicinal products can be an entity residing or having its registered office in a member state that supplies or makes a product available on the market, provided it is neither a manufacturer nor an importer. This also includes a healthcare provider who imports a product from another member state into the territory of the Republic of Poland for the purpose of providing healthcare services.

In the pharmaceutical market, there are five categories of medicinal product availability, which influence, among other things, the availability of drugs in non-pharmacy facilities and/or the possibility of mail-order sales. These categories can be divided into: prescription drugs (prescribed by a doctor – Rp or prescribed by a doctor for restricted use - Rpz), collectively referred to as "RX", drugs prescribed by a doctor that contain narcotic substances or psychotropic substances (Rpw), drugs used exclusively in closed treatment facilities (Lz), over-the-counter drugs sold without a prescription, designated by the abbreviation "OTC" (Over the counter).

Polish legislation stipulates that medicinal products can only be distributed according to rules strictly defined in - Pharmaceutical Law and its implementing regulations. This ensures that state authorities register and verify drugs against specific quality requirements and expiration dates before allowing them to enter circulation, enabling control over their wholesale and retail distribution.

In Poland and worldwide, the distribution of medicinal products occurs within a complex system that encompasses various distribution models. These include: the traditional wholesale model, the direct distribution model, the mixed model, the specialised model, hospital distribution and retail distribution. The first model is the most common. Drug manufacturers supply their products to pharmaceutical

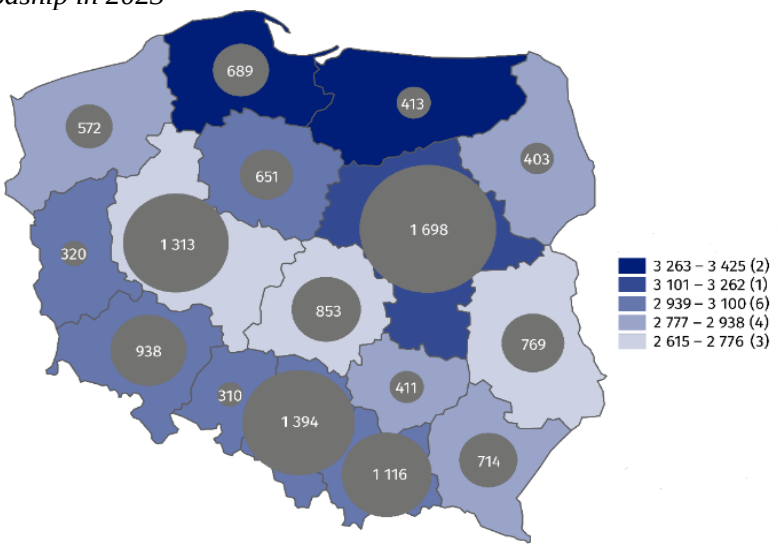
wholesalers, who then distribute them to retailers and healthcare facilities. In the direct distribution model (DTP – *Direct to Pharmacy)*, drugs are delivered directly to pharmacies or hospitals, bypassing wholesalers.

This method is primarily used for specialized medications or those with higher value. The mixed model combines elements of both the traditional wholesale and direct distribution models (some products are sent directly to pharmacies while others go through wholesalers).

The specialised model (Exclusive Distribution Model) is characterized by the fact that the manufacturer entrusts distribution solely to one entity, which is responsible for the entire process of delivering medicines to pharmacies and hospitals. The hospital distribution system involves delivering medications directly to hospitals by manufacturers or wholesalers through public tenders (Zygmunt, 2023).

Additionally, there is retail trade of medicinal products managed by community pharmacies, herbal and medical shops, and pharmacy points, which have been declining in number year by year (Figure 1). Pharmacy points are established in rural areas where there is no community pharmacy. With the advancement of digitalization, online pharmacies and telemedicine are playing an increasingly significant role in this process by offering online orders and home delivery of over-the-counter medications. Pharmaceutical wholesalers are responsible for supplying medications to pharmacies, herbal shops, pharmacy points, and healthcare facilities (which can only use medicinal products within the framework of provided health services).

Figure 1. *Community pharmacies and pharmaceutical points according to voivodship in 2023*



Source: *Central Statistical Office, 2024.*

According to the analysis by the Central Statistical Office of Poland (Główny Urząd Statystyczny) entitled "Health and Healthcare in 2023," the number of publicly accessible pharmacies in Poland was 11,500 (including both public and institutional pharmacies) and 1,100 pharmacy points. This represented a decrease of 1.6% compared to 2022.

As of December 31, 2023, a total of 63,200 people were employed in these pharmacies and pharmacy points, including 25,900 pharmacists and 31,900 pharmacy technicians (compared to 2022, this was an increase of 0.4% for pharmacists but a decrease of 0.3% for pharmacy technicians). Similar to the previous year, the majority of employees were women (comprising 83.4% of pharmacists and 94.6% of pharmacy technicians).

Additionally, data from the IQVIA report indicated that in February 2024, there were 12,617 pharmacies and pharmacy points operating in Poland, which is 234 fewer than the previous year (since 2018, approximately 2,000 pharmacies have disappeared from the map of Poland, with the highest losses in Lower Silesia). On average, there were 2,996 people for each publicly accessible pharmacy and pharmacy point (an increase of 40 from the previous year). The highest population per pharmacy was recorded in Pomerania (3,425), while the lowest was in Lublin (2,615).

The authors of the analysis emphasize that a significant problem is the uneven distribution of pharmacies – access to medications and medical products is worse in rural areas compared to urban ones (in 2022, the population per publicly accessible pharmacy in rural areas was approximately 8,200 citizens), which results in the necessity for patients to travel to neighbouring municipalities to fill their prescriptions.

The distribution of medicinal products in Poland is governed by a number of legal acts, primarily the Pharmaceutical Law (Journal of Laws of 2024, item 686), which outlines the qualifications required for entities involved in the distribution of medicinal products and the rules for authorizing drugs for sale in public pharmacies (Article 68, par. 1), pharmacy points (Article 70, par. 1), and non-pharmacy outlets (such as herbal and medical supply stores or general stores - Article 71, par. 1).

Technical distribution guidelines for entities holding licenses to trade in medicinal products are defined by Good Distribution Practices (GDP). As pharmaceutical distribution is a regulated industry, appropriate licenses must be obtained depending on the type of distribution.

The Pharmaceutical Law stipulates that operating a pharmaceutical wholesaler requires a license from the Chief Pharmaceutical Inspector (Article 74, par. 1), while a public pharmacy can be operated based on a license authorizing pharmacy operation (Article 99, par. 1).

Pharmaceutical wholesalers are obligated to procure medicinal products exclusively from responsible entities, entrepreneurs with licenses to manufacture or import medicinal products, and entrepreneurs engaged in wholesale trade - after verifying the validity of the relevant license. The movement of goods within a pharmaceutical wholesaler from producer to pharmacy is illustrated in Figure 2.

Figure 2. *A graphic illustration of the movement of goods within a pharmaceutical wholesaler from producer - pharmacy*

Source: *Janicki, Nowomiejski, and Rosińska, 2016.*

According to pharmaceutical law, direct sales from pharmaceutical wholesalers to patients are prohibited. Only open-access pharmacies or open-access pharmacies conducting mail-order sales via the internet are permitted to do this. Open-access pharmacies can supply medicinal products solely for the following purposes: direct supply to the public, free provision to patients for treatment needs, supplying healthcare facilities (based on demand) or free delivery to social welfare homes.

Furthermore, regulations allow for the delivery of products to public authorities, entities engaged in medical activities (based on demand), and supplying entities not authorized to trade in medicinal products with specific categories of availability, excluding medicinal products containing psychoactive substances.

The pharmaceutical distribution sector is characterized by a multitude of participants on both sides of the market. On the demand side, there are primarily patients (consumers), but also prescribing doctors (*prescribers*) and pharmacists. Factors influencing demand include patients' access to healthcare services, the prescriptions made by doctors regarding which medications should be used and in what quantities, as well as recommendations from pharmacists (Krążyńska, 2013).

Therefore, the position of the patient-consumer differs from that of an average buyer of other goods, as their freedom to make purchasing decisions is limited. In terms of supply structure, it is essential to distinguish between: manufacturers, wholesalers, healthcare facilities, and pharmacies (including hospital pharmacies, community pharmacies, and workplace pharmacies). Wholesalers play a particularly significant role in this supply chain as they are primarily responsible for distributing medicinal

products in the market. Their main tasks include storing inventory and delivering goods to retail points at specific locations and times (most often to pharmacies and outpatient clinics). It is accurately observed that distributors bear the risk of fluctuations in demand for specific medications, which can materialize in the necessity to incur costs for disposing of expired medication batches.

Pharmaceutical distribution systems in Poland are multi-entity, meaning they involve all forms of intermediation: pharmaceutical wholesalers, wholesale distributors, small intermediaries, retailers, and final purchasers (patients) (Janicki, Nowomiejski, Rosińska, 2016). Diverse drug distribution models significantly affect the availability of medicinal products across different regions of the country. In urban areas, where there are more pharmacies and medical facilities, access to medications is better, especially for expensive or specialized drugs.

Conversely, in rural and less urbanized regions, there is a higher risk of limited availability, particularly with models that emphasize direct distribution. A remedy for the limited availability of medicinal products in villages and smaller urban centres (due to fewer pharmacies and points of sale per capita) is the *e-commerce* channel and legislative changes that will allow patients to purchase medicinal products with home delivery (especially prescription medications RX) or pick them up from parcel lockers (particularly those that do not require special temperature conditions during storage and transport).

4. Medicinal Products in Socio-Economic Development in Poland

According to the MarketHub portal, the pharmaceutical market in Poland was one of the most strategic sectors in 2023. Market analysis revealed that 53.9% of companies involved in the production of basic pharmaceutical substances, medicines, and other pharmaceutical products implemented innovations (e.g., contract outsourcing services, cost optimization, digitalization, etc.). This translated into 3.1% of all expenditures in the country on innovation.

The Polish pharmaceutical market is considered a European anomaly due to the minimal influence of international corporations. The ten largest entities account for nearly 90% of the total turnover in the pharmaceutical distribution market. Among these, the three largest distributors—Neuca, Grupa Pelion, and Farmacol—are responsible for approximately 70% of the value of pharmaceutical sales to pharmacies.

It is noteworthy that the pharmaceutical industry contributes about 1.33% to GDP and injects around PLN 2.5 billion annually into the state budget through CIT (corporate income tax) and VAT (value-added tax). In 2023, the pharmacy market reached a value (at retail prices for patients) of approximately PLN 35 billion, marking a 9% increase from 2022.

Prescription medications accounted for 54% of sales value. According to research conducted by the World Health Organization (WHO), investments in health yield economic benefits for the healthcare sector, other sectors, and the entire economy, with an estimated fourfold return on every invested dollar. Forecasts from PMR Market Experts indicate that the value of the pharmaceutical market in Poland is expected to rise to PLN 54 billion by 2027 (an increase of nearly 25%, or PLN 11 billion).

Poland has one of the lowest average drug prices in Europe, largely due to a significant share of generic medications. The average price of drugs, expressed in net producer prices, is approximately €8 across Europe, while in Poland, it stands at around €4. The country also experiences a very low availability of innovative drugs, leading to a relatively high popularity of clinical trials conducted domestically, which provide access to experimental innovative medications. The main factor shaping the demand for medications in Poland is the demographic factor.

Additionally, the recent difficulties patients face in accessing specialized medical care, caused by a staffing crisis in the healthcare system, also influence demand. The lack of specialist consultations results in a further decrease in the quantity of purchased specialized and innovative medications. Furthermore, there has been a noted decline in the sales value of state-reimbursed medications, attributed to the choice of cheaper equivalents and generic substitutes during negotiations.

According to the Central Statistical Office (GUS) in Poland, there is a problem of uneven distribution of pharmacies. This issue has been known for a long time and was partially addressed by the "pharmacy for pharmacists" initiative, which is an amendment to the Pharmaceutical Law introduced in 2017. The amendment includes numerous restrictions on opening new pharmacies, including geographical ones. Its aim was to prevent pharmacies from being established in areas where there are already too many, (e.g., in city centres).

Instead, regulations were introduced to encourage the opening of pharmacies in municipalities where there is more than one pharmacy per 3,000 residents. Pharmacies and pharmacy points are crucial elements of the healthcare system, providing the population with medications and medical supplies in both urban and rural areas. Pharmacy points operate almost exclusively in rural areas, supplementing the network of pharmacies across the country.

Additionally, these points can only sell ready-made medications. Selected medicinal products (with specific dosages and packaging sizes), known as OTC (over the counter) drugs, can also be purchased at shops and gas stations. Examples include pain relievers, antipyretics, disinfectants, and medications for indigestion.

It is worth mentioning that in recent years, the demand for such products has surged dramatically, resulting in Poles ranking second in Europe (after the French) in terms

of the number of packages purchased per capita (IQVIA, 2024). This situation is particularly concerning, as some popular OTC medications contain substances classified as Group III-N, which have an unknown potential for addiction. The ratio of residents to pharmacies varies by voivodship, ranging from 2,800 (in the voivodships of Greater Poland and Lublin) to 3,600 (in the voivodships of Warmia-Masuria and Pomerania). In rural areas, there is one accessible pharmacy for every 9,000 residents.

Considering the points of sale operating in rural areas, the average rural population per accessible pharmacy and point of sale in 2023 was approximately 5,000. The highest population per pharmacy or pharmacy point was recorded in the districts surrounding cities with county rights – specifically in Kwidzyn, Radom, Siedlce, and Przemyśl (over 5,000 people per pharmacy) (Central Statistical Office, 2024).

However, the authors of the report note that the so-called rural counties (surrounding cities with county rights) have their own characteristics, particularly due to the location of many public services in the county seat. The best availability of pharmacies and pharmacy points was observed in the counties of Krosno, Konin, Ostrołęka, and Kłobuck, where there were fewer than 2,000 people per pharmacy.

In 2022, Poland had 11,700 general pharmacies and institutional pharmacies, along with 1,100 pharmacy points employing nearly 58,000 individuals. By the end of 2023, there were 11,500 pharmacies (both general and institutional), representing a decline of 1.6% compared to the previous year.

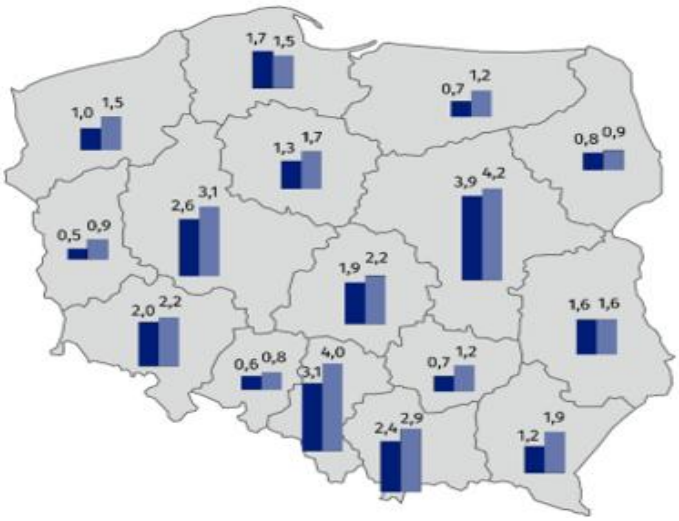
Additionally, there were 1,100 pharmacy points, which was a decrease of 2.5% from the previous year, employing 57,800 pharmacists and pharmacy technicians. The permanent night duties were carried out by 2.2% of generally available pharmacies, while periodic duties - by 15.3%. The mail order sales of medicinal products via the internet were conducted by 197 pharmacies and 6 pharmaceutical outlets.

On average, there were 2,996 people per one generally available pharmacy and pharmaceutical outlet (an increase of 40 compared to the previous year). The highest number of inhabitants per one generally available pharmacy and pharmaceutical outlet was recorded in the Pomeranian Voivodeship (3,425), while the lowest was in the Lublin Voivodeship (2,615).

According to GUS, at the end of 2023, there were 63,200 people employed in generally available pharmacies, hospital pharmacies, and pharmaceutical outlets, including 25,900 pharmacists and 31,900 pharmaceutical technicians.

Compared to 2022, this represents an increase of 0.4% and a decrease of 0.3%, respectively. A significant majority of the workforce consisted of women (83.4% of pharmacists and 94.6% of pharmaceutical technicians).

Figure 3. *Employees working in community pharmacies and pharmacy points by voivodeships in 2023*



Note: *- Dark navy blue – Master's degree in pharmacy,*
- Lighter blue – Pharmacy technicians.
Source: *Central Statistical Office, 2024.*

According to data published in the report "Pharmaceutical Race of Nations," 63% of surveyed Poles believed that the quality of drugs produced in the country is high or very high, and this belief has strengthened over the past decade. Only 5% of the population rated them negatively. Over 60% of participants in the study declared a preference for domestic medications in pharmacies (regardless of price or when they are cheaper). Additionally, 45% of Poles expressed concern about situations where medications for specific conditions or those they currently use might be unavailable in pharmacies.

Furthermore, 52% of respondents experienced a situation where the sought-after medication was out of stock in pharmacies. According to the report's authors, Poles view the domestic pharmaceutical industry as a guarantor of their drug safety and health. 67% of those surveyed stated that thanks to medications produced in Poland, they can be confident that drugs will always be available, while 61% felt safer if most medications available in pharmacies were produced domestically. Conversely, 53% indicated that they have greater trust in drugs made in Poland than those imported from abroad (Obłąkowska and Bartoszewicz, 2022).

5. Perspectives for the Development of Logistics in Ensuring Equal Access to Medicinal Products (Drugs) in Poland.

The availability of medicinal products is one of the factors that guarantees public health and pharmaceutical safety. The term "market availability" means that a medicinal product is subject to trade, and the pharmaceutical market is supplied with

that product. Only then do pharmacies and healthcare facilities not face issues related to the availability of these products, as they are secured in adequate quantities. Situations where medicinal products are unavailable and patients cannot benefit from them, potentially leading to a deterioration in their health, are referred to as shortages of medicinal products.

The topic of availability of medicinal products and its related issues is addressed in Directive 2001/83 and the Pharmaceutical Law. Currently, there are approximately 16,000 registered medicinal products in Poland. The Ministry of Health stated in October 2022 that there is no systemic risk of drug shortages in the country; rather, the issues reported by the media pertain only to individual products and specific pharmaceutical companies on a local scale.

However, industry specialists point out that the problem of drug availability in Poland has persisted for several years. One of the primary causes of drug shortages is identified as their illegal export, but the reasons for these shortages have been increasing year by year. Currently, the main reason for this situation is the production costs faced by manufacturers, linked to pressures from the Ministry of Health to lower drug prices, which has led to the unprofitability of producing certain medicinal products.

Companies are trying to cope with the situation by seeking cheaper solutions, such as sourcing raw materials for drug production from China. It is estimated that around 80% of drugs available in Europe are made from substances sourced from Asia, and problems related to their supply directly affect pharmacy supplies in many countries, including Poland (Otto, 2024).

The Ministry of Health reports that there are four main causes for the issues related to the availability of medicinal products in Poland: business decisions made by responsible entities to cease the production of a specific medication, withdrawal of manufacturers from the European or Central European markets, random causes or force majeure such as breakdowns that prevent medications from being introduced into circulation, as well as difficulties in transporting them from abroad (disrupted supply chains), as well as a surge in demand for specific medicinal products.

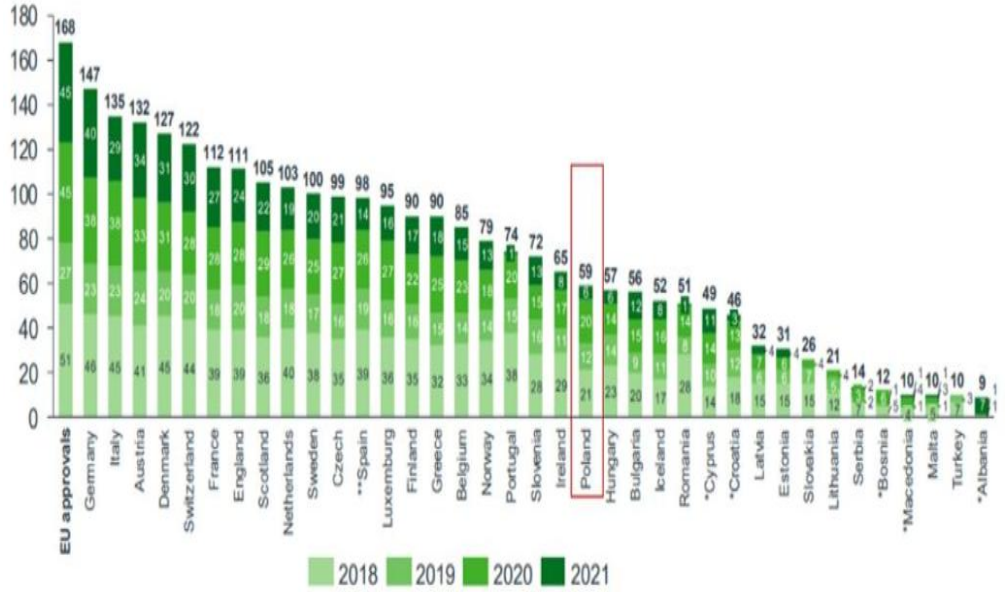
To address these issues, the Ministry of Health has undertaken several actions, including: establishing a team in 2019 to combat shortages in the availability of medicinal products, creating a team to assess interoperability in teleinformatics, registration, and medical systems used within drug policy, issuing announcements regarding lists of medicinal products, special dietary foods, and medical devices at risk of unavailability on the territory of the Republic of Poland.

Moreover, the Ministry of Health has introduced legislative changes regarding the availability of medicinal products in the Polish market, collaboration with national and regional medical consultants, and interactions with manufacturers and suppliers.

These changes aim to continuously assess supply volumes and plan future deliveries while monitoring the availability of medicinal products in Poland in cooperation with the Chief Pharmaceutical Inspector. Furthermore, the Minister of Health is granting significantly more approvals for the importation of medicinal products from abroad as part of emergency import measures.

According to "Co w Zdrowiu," modern medicines are becoming increasingly available to Polish patients. Confirmation of this situation can be found in data from 2021, which shows that Poland ranked 22nd out of 37 European countries in this regard (Figure 4).

Figure 4. *Graphical representation of the full availability of medicines according to approval (2018-2021) - the number of medicines available to patients as of January 5, 2023, by the year of marketing authorization in Europe.*



Source: *Kurowska, 2023.*

According to a report based on IQVIA data, Poland has achieved its highest ranking in nearly 20 years in the W.A.I.T. (Waiting to Access Innovative Therapies) survey, moving up from 25th to 21st place regarding access to innovative drugs. This represents an increase of 17 therapies compared to the previous year analysed. Consequently, during the examined period, patients in Poland had access to 59 out of 168 innovative medications (Kurowska, 2023).

An interesting solution, the Emergency Access to Drug Technologies (RDTL) is a financing procedure introduced in 2017 that allows for the funding of treatments using new or novel drugs for patients who have no other currently available reimbursed drug technology that can assist them.

In 2017, the SENT system was introduced to monitor the transport of specific groups of goods, such as fuels and tobacco products. This system is used for registering transported goods and collecting information about the entities that send, transport, and receive them.

In 2018, through an amendment to the Act of March 9, 2017, on the monitoring of road and rail freight transport (Journal of Laws of 2018, item 2332 as amended), the monitoring of pharmaceutical products was also included in this system. (Gałązka-Sobotka and Zyśk *et al.,* 2019).

The COVID-19 pandemic has highlighted logistical shortcomings in the pharmaceutical sector and healthcare. The delivery of vaccines to all locations in Poland and around the world has underscored the importance of precise logistics and cold chain logistics. According to the Biopharma Cold Chain Sourcebook, their utilization is expected to increase by approximately 48% from 2018 to 2024 (Bałdyga, 2023).

Issues related to the availability of medications and the development of mobile technologies contribute to the creation of a new form of drug distribution based on integrated data sets and a system that allows for the collection of data in one place (where a particular medication is located and in what quantity) to predict and plan the demand for all medications.

In response to new requirements regarding the transportation and storage of medicinal products, it is essential to build modern logistics centres equipped with active temperature control systems.

An example of such a solution is UPS Healthcare, which built a logistics centre in 2022 in Błonie, near Warsaw. The company is also working on developing a system that will collect information about products stored in all UPS warehouses worldwide. UPS aims to introduce a tool designed to improve the efficiency of inventory management, which will ultimately impact the effectiveness of drug distribution globally and optimize transportation costs.

In the UK, UPS Healthcare has also launched a comprehensive prescription delivery service through the UPS Healthcare pharmacy. At the same time, in many countries, a nursing care service is being developed, where medications delivered by UPS Healthcare to a patient's home are administered by a specialized nurse.

All these efforts aim to relieve the healthcare system and facilitate the treatment of chronically ill individuals (Bałdyga, 2023).

However, Polish law currently excludes the application of such solutions, thereby depriving patients of access to medications through convenient distribution channels.

6. Conclusions

The distribution of pharmaceuticals plays a crucial yet often underestimated role in the healthcare system, serving as an integral part of the supply chain that directly impacts patient health, lives, and public safety. An efficiently functioning pharmaceutical distribution system is essential not only for eliminating delays in access to medications but also for ensuring continuity of treatment and minimizing epidemiological risks.

Examples such as the immediate availability of antibiotics for patients with bacterial infections or the constant supply of medications for those suffering from chronic diseases illustrate how pharmaceutical distribution supports the healthcare system and safety. Modern channels of pharmaceutical distribution also facilitate the delivery of blood, medical devices, and medicinal products necessary for life-saving surgeries, where a short delivery time is critical for success.

A prime example of such a distribution channel is ALAB Laboratories, which has been delivering blood to hospitals nationwide for two years (the pilot program started in Warsaw) using a specialized aircraft (drone) (The transport of blood by drone by ALAB laboratoria, 2022,
https://www.youtube.com/watch?v=6j9AuDEwzjg).
This represents the best and latest example confirming the importance of logistics in ensuring equal access to medicinal products in Poland.

The Polish drug distribution system faces numerous challenges that directly impact the health security of its citizens. The uneven availability of pharmacies, particularly in rural and less urbanized areas, poses a significant threat to the health of residents in these regions. The closure of more facilities due to unprofitability leads to serious inequalities in access to medications and healthcare services. Lack of access to medicines during emergencies, such as pandemics, can result in substantial public health risks, thereby increasing threats to national security.

Polish legislation regulating drug distribution lags behind that of Western countries. Examples from the Netherlands and France, where technological advancements have facilitated access to medications through modern forms such as vending machines for drugs or delivery by postal workers, demonstrate that innovative solutions can significantly improve the availability of medicinal products.

In the context of health security, such solutions, including mobile pharmacies on solar-powered bicycles (as seen in the Netherlands), are particularly important for an aging population that may not always have the means to reach a pharmacy independently.

A potential solution to the problem could be *medical delivery services*, which involve delivering medications directly to patients through companies like Glovo.

The introduction of such services could improve access to medications, especially in hard-to-reach areas, contributing to enhanced health security for citizens. Mobile pharmacies and integrated tracking systems (similar to UPS Healthcare in the UK) may be crucial in ensuring uninterrupted access to medications during crises.

Modern pharmaceutical distribution channels, based on advanced technologies such as the Internet of Things (IoT), artificial intelligence, and ERP systems, represent the future of the pharmaceutical sector. Their development can contribute not only to the optimization of drug deliveries but also to improving public health safety across society. Poland should strive for the integration of such solutions, which can aid in crisis management, respond to emergencies, and secure public health.

In conclusion, the pharmaceutical distribution system, particularly in the context of increasing challenges related to infrastructure, an aging population, and the need to respond to public health threats, plays a crucial role in the health security of the country.

Poland must strive to implement modern technologies and logistical solutions that will enhance the availability of medications and ensure safety for all citizens, regardless of their place of residence. Adopting solutions from the West and adjusting national legal regulations to the dynamically changing pharmaceutical reality is key to success.

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