ORIGINAL ARTICLE

MEDICAL SERVICES IN THE POLISH CAMPAIGN OF 1939 – A SYNTHESIS. PART I: MEDICAL SERVICE CAPACITY

Służba zdrowia w kampanii polskiej 1939 roku – synteza. Część I: Potencjał służby zdrowia

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Abstract

Introduction and objective: This research paper was created as part of the project "Polish Campaign of 1939 – Synthesis" conducted by the War Studies University. The aim of this three-part article is to provide a comprehensive account of the role of the Polish health service during the 1939 campaign. The subsequent sections examine the initial capabilities of the health service, wartime planning and preparations, and the actual participation of medical services during the campaign. The primary research question focuses on the factors that led to the collapse of Poland's medical services in September 1939. **Material and methods:** The author drew on historical materials collected at the Central Military Archive (Warsaw-Rembertów) and the Archives of the Polish Institute and the General Władysław Sikorski Museum (London). This synthesis also incorporates previous research by historians, published sources, and a wide range of personal recollections and testimonies. **Results:** The Polish health service suffered a defeat in 1939. The system for evacuating and treating the wounded collapsed within the first days of the war. Evacuation difficulties, rapidly depleting stocks of prophylactic serums, and delays in surgical care led to widespread complications from infected wounds, including numerous cases of tetanus. **Conclusions:** The main factors that led to the medical crisis in 1939 included the very limited initial capacity of the medical service (staff shortages, underdeveloped hospitals), low financial investment and insufficient material reserves, the highly centralized medical supply system, reliance on railways for medical evacuation, the low degree of motorization in both the Polish Army and society, poor road conditions, and the nature of the enemy's operations – sudden, deep attacks on the rear, disruption of communication networks, and targeting of civilian areas.

Streszczenie

Wprowadzenie i cel: Praca powstała w ramach projektu „Kampania polska 1939 roku – synteza", prowadzonego przez Akademię Sztuki Wojennej. Celem trzyczęściowego artykułu jest kompleksowe przedstawienie działań polskiej służby zdrowia w trakcie kampanii polskiej 1939 r. W kolejnych częściach omówiono wyjściowy potencjał służby zdrowia, plany i przygotowania wojenne oraz udział służby zdrowia w kampanii wojennej. Podstawowe pytanie badawcze dotyczyło przyczyn załamania się systemu pomocy rannym we wrześniu 1939 r. **Materiał i metody:** Podstawowy zasób źródeł, który posłużył do opracowania artykułu, znajduje się w Centralnym Archiwum Wojskowym (Warszawa-Rembertów) oraz w Archiwum Instytutu Polskiego i Muzeum im. gen. Władysława Sikorskiego (Londyn). W syntezie uwzględniono również wcześniejsze ustalenia historyków, źródła drukowane oraz szeroki wybór wspomnień i relacji. **Wyniki:** Polska służba zdrowia poniosła w 1939 r. klęskę. System ewakuacji i pomocy rannym w ciągu kilku pierwszych dni wojny uległ załamaniu. Problemy z ewakuacją, szybko wyczerpujące się zapasy surowic profilaktycznych oraz spóźniona pomoc chirurgiczna były przyczyną masowo występujących powikłań septycznych ran, w tym licznych przypadków tężca. **Wnioski:** Do najważniejszych przyczyn, które doprowadziły do katastrofy sanitarnej w 1939 r., należały: bardzo skromny potencjał wyjściowy służby zdrowia (deficyt kadr, niski poziom szpitalnictwa), małe nakłady finansowe, brak odpowiednich rezerw materiałowych, centralizacja systemu zaopatrzenia sanitarnego, wiodąca rola kolei w planach ewakuacji sanitarnej, niski stopień motoryzacji Wojska Polskiego i społeczeństwa, zły stan dróg oraz sposób prowadzenia walki przez wroga (gwałtowne i głębokie uderzenia na tyły polskiego państwa, porażenie sieci komunikacyjnych, atakowanie celów cywilnych).

Keywords: medical services; medical evacuation; Polish campaign of 1939

Słowa kluczowe: służba zdrowia; ewakuacja medyczna; kampania polska 1939 roku

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Introduction

The 1939 war campaign ended with the greatest defeat in the history of Polish statehood. In just over a month, the Second Polish Republic lost its territory, which was partitioned between two occupiers: Nazi Germany and the Soviet Union. The Polish Army was spectacularly defeated, and only a small fraction of the mobilized soldiers managed to reach neutral countries with the intention of continuing the fight. The Polish political authorities went into exile. As a result of the campaign, thousands of Polish citizens, both civilians and soldiers, lost their lives. For the population that remained within the territory of pre-war Poland, a period of persecution, extermination, deportation, poverty, and hunger began. In collective memory, the defeat in 1939 is associated with profound trauma. The consequences of the Nazi and Soviet invasion of Poland had far-reaching political, social, and economic effects – not only for Poland but for the whole of Europe.

Although many years have passed and numerous works have examined the Polish campaign of 1939, a comprehensive, multidimensional synthesis is still lacking. The need to undertake work on such a study was recognized by the staff of the War Studies University. An interdisciplinary research team appointed for this purpose, under the leadership of Col. Dr. Juliusz S. Tym, Professor at the War Studies University, received a targeted grant from the Ministry of Education and Science (No. MEiN/2021/DPI/319).

Among the issues requiring deeper analysis within the project was the broadly understood field of logistics, including medical services.

The following article is the result of work carried out within the aforementioned research team. The aim was to present the activities of the medical service during the Polish campaign of 1939 as coherently as possible. A comprehensive approach to the subject required consideration of the initial potential of the health service, war plans and preparations, and the course of military operations. The fundamental research question concerned the reasons for the collapse of the system providing care for the wounded in September 1939.

The state's medical and sanitary preparedness for war was a multidimensional and highly complex matter. In this sphere, the interdependence between military and civilian structures was particularly evident. The basic tasks of the military medical service, as defined in the 1929 regulation "Medical Service in the Field", were of a universal nature. They included *preventing a reduction in troop numbers by averting disease and treating those soldiers who were lost due to wounds and illness* [1]. It should be noted that while in peacetime these tasks could be carried out by the forces and resources of the military health service, wartime expansion of the structures required the mobilization of reserve personnel from among civilian doctors, dentists, pharmacists, and other medical staff. Their mobilization, by its very nature, depleted the personnel of civilian healthcare institutions. In the event of war, it was planned to utilize the resources of various organizations, primarily the Polish Red Cross (PCK) and, to some extent, civilian hospitals. Civilian material resources stored in pharmacies were also intended for use in the war zone. The sources of pharmaceutical and dressing supplies functioned, at least in part, as a common denominator. Any shortages in this area impacted both the civilian and military sectors alike. Warfare inevitably generated losses among the civilian population. Civilian hospitals had to be prepared to accommodate them – at least in theory. Given this overlap, it is difficult to clearly separate the civilian and military medical services when discussing the preparations of the Polish health service for war and its role in the 1939 campaign.

A review of the existing literature on the subject goes beyond the scope of this article. However, the most important publications issued after 1989 should be mentioned: Czesław Marmura, Medyczna myśl wojskowa II Rzeczpospolitej ["Military Medical Thought of the Second Polish Republic"] [2]; Andrzej Felchner, Pod znakiem Eskulapa i Marsa. Służba zdrowia Wojska Polskiego (od jesieni 1918 r. do mobilizacji w 1939 r.) ["Under the Sign of Aesculapius and Mars. The Health Service of the Polish Army (from autumn 1918 to mobilization in 1939)"] [3]; and Waldemar Rezmer, Operacyjna służba sztabów Wojska Polskiego w 1939 roku. Organizacja. Zasady funkcjonowania. Przygotowania do wojny ["Operational Service of the Staffs of the Polish Army in 1939. Organization. Principles of Operation. Preparations for War"] [4]. Although these works made a significant contribution to our knowledge of the functioning of the Polish health service in the interwar period, none of them provided a broader discussion of the medical service activities in September 1939.

The primary set of archival documents used to prepare this three-part article is held in two institutions: Central Military Archives (Centralne Archiwum Wojskowe – CAW) in Warsaw-Rembertów and the Archives of the Polish Institute and Sikorski Museum in London (Archiwum Instytutu Polskiego i Muzeum im. gen. Władysława Sikorskiego – IPMS). Special attention should be given to the accounts of the 1939 campaign collected in the IPMS. It should be noted, though, that these were compiled in exile – in France or the United Kingdom. Some of them were submitted to a commission established in connection with the outcome of the 1939 military campaign. Therefore, the content of the accounts may have been modified to present the course of events and the role of their authors in a specific light. They should thus be approached with a degree of critical scrutiny and caution. An important historical source, especially for describing the potential of the Polish health service, is Mały Rocznik Statystyczny 1939 ["Concise Statistical Yearbook 1939"] [5]. In preparing the synthesis, the existing findings of other historians were also taken into account.

Personnel potential

Interwar Poland suffered from a shortage of medical personnel. In 1938, the state had a total of 12,917 physicians. In relation to the population, this amounted to a meager ratio of 3.7 doctors per 10,000 inhabitants. Thus, compared with most European countries, Poland ranked near the bottom. Among the 18 countries included in the Concise Statistical Yearbook 1939, Poland occupied the penultimate place, ahead only of Lithuania and Finland

Table 1. Number of physicians per 10,000 inhabitants in selected European countries. Source: Mały Rocznik Statystyczny/ Concise Statistical Yearbook [5]

Country	Year	Number of physicians per 10,000 inhabitants
Hungary	1936	11.2
Switzerland	1937	10.8
Italy	1935	8.3
Latvia	1936	7.9
Denmark	1936	7.9
Norway	1936	7.7
Belgium	1934	7.4
Czechoslovakia	1936	7.4
Germany	1937	7.3
Netherlands	1936	7.0
France	1937	6.5
Soviet Union	1934	5.0
Bulgaria	1936	4.4
Sweden	1936	4.3
Poland	1938	3.7
Yugoslavia	1936	3.7
Lithuania	1937	3.4
Finland	1937	3.4

(see Tab. 1) [5]. Another unfavorable factor was the extremely uneven distribution of personnel. More than half of the doctors (53%) were concentrated in large cities with populations exceeding 100,000. Among the voivodeships, the best situation in this respect was in Krakowskie Voivodeship, while the worst was in Wołyńskie Voivodeship (see Tab. 2).

Table 2. Number of physicians in individual voivodeships in Poland (as of 1938). Source: Mały Rocznik Statystyczny/Concise Statistical Yearbook [5]

Voivodeship	Number	per 10,000 inhabitants
Białostockie	427	2.3
Kieleckie	634	2.0
Krakowskie	1333	5.3
Lubelskie	479	2.0
Lwowskie	1653	4.9
Łódzkie	850	4.1
Nowogródzkie	205	1.8
Poleskie	219	1.7
Pomorskie	651	3.1
Poznańskie	886	3.5
Stanisławowskie	414	2.6
Śląskie	555	4.0
Tarnopolskie	337	2.0
Warsaw (city)	2816	22.1
Warszawskie	474	2.0
Wileńskie	619	4.6
Wołyńskie	365	1.6
Total	12917	3.7

The deficit also affected dentists, of whom there were only 3,686 in the country in 1938 (1.1 per 10,000 inhabitants) [5]. Completing this picture was the dramatically small number of professional nurses, who, according to official statistics, numbered 6,674 nationwide (1.9 per 10,000 inhabitants) [5]. Some support to the medical workforce came from 1,403 feldshers [5]. The problem with this professional group lay in their severely limited competencies and varied level of expertise. Since no new feldshers were trained during the interwar period, the average age in this group must have been high. The situation was somewhat better in the case of pharmacists with higher education, of whom there were 3,787 in 1938. They were supported by a group of 1,638 pharmacy assistants [5].

A concern for the military health service leadership was that, of the total number of physicians practicing in the Second Polish Republic, a significant proportion (estimated at around 40%) belonged to national minorities. It was argued that within the medical community (...) *the Polish element is steadily diminishing. This phenomenon must be considered dangerous, for the health of the nation, the most precious treasure we possess, is thus continually entrusted to non-Polish hands* [6]. It may be assumed that there were also concerns about how medical service personnel of non-Polish nationality would behave in the event of armed conflict.

In August 1939, the military health service had 1,215 officers on active duty, including 84 reserve officers. This number comprised 917 doctors, 116 pharmacists, 59 dentists, and 123 other officers, mainly sanitary, serving in administrative and instructional roles [3]. Thanks to reserves, however, the personnel potential of the military health service was considerably greater. It should be noted, though, that mobilization of reserves simultaneously depleted the personnel of civilian health service structures. An example was the Pomorskie Voivodeship, where more than 60% of doctors were to be mobilized [7].

Due to the lengthy nature of medical education, there was no possibility of an emergency and rapid increase in the number of medical personnel in the period preceding the war. The education of physicians alone lasted at least seven years, six of which were devoted to academic study, followed by one year of postgraduate internship. It should be emphasized that during this time a medical student acquired only basic professional competencies. Training a specialist with appropriate clinical experience (particularly in surgical specialties, which were highly needed during wartime) took several additional years.

However, it is worth noting that in the interwar period Poland made significant efforts to increase the number of medical professionals. Medical faculties operated at the universities of Kraków, Lwów, Poznań, Warsaw, and Wilno. Dentistry was also taught at these faculties, with the exception of Warsaw, where an independent Academy of Dentistry functioned outside the university structure. Between 1923 and 1938, the number of physicians per capita increased by more than 50%. For dentists, the increase was even greater, reaching 175%. However, the initial staffing deficits and needs were so

large that, during 20 years of the reborn Polish state, it was not possible to even approach the levels of more developed countries.

The training of medical personnel for the Polish Army was carried out by the Sanitary Training Center in Warsaw (Fig. 1). Instruction was conducted along two tracks. Future career medical officers pursued medical studies at the Faculty of Medicine of the University of Warsaw, while the Sanitary Training Center was responsible for general military and military-medical training. Similarly, officer cadets studying pharmacy were enrolled as students of the Faculty of Pharmacy at the University of Warsaw. Future military dentists were trained at the Dental Academy.

In total, between 1922 and 1939, 601 professional officer cadets were trained at the Sanitary Training Center and its predecessors, of whom 474 graduated as medical service officers [3, 8]. In addition to preparing career personnel, the Center also trained reserve cadets as well as professional sanitary non-commissioned officers. The total number of trained reservists is difficult to determine.

Graduates of civilian medical faculties (medicine, dentistry, pharmacy) were subject to 12 months of compulsory military service. This consisted of six months of training at the Sanitary Training Center and an additional six months of practical service within a line formation or an appropriate sanitary establishment. For doctors, the purpose of the service was to prepare reservists ready to fill positions such as junior regimental doctors, doctors of independent battalions (or squadrons), commanders of sanitary companies in infantry divisions or sanitary platoons in cavalry brigades, or chiefs of wartime hospitals. Pharmacist reservists, in turn, were designated for work in military pharmacies, bacteriological-chemical laboratories, and sanitary supply establishments. Dentists, in turn, were to staff positions in field dental laboratories.

Col. Dr. Wincenty Babecki, who in 1939 served as deputy director of the Department of Health Service at the Ministry of Social Welfare, pointed to the problem of insufficient clinical competence among military physicians. In his assessment, postgraduate education for military doctors focused mainly on issues of sanitary tactics, army organization, service structures, and similar matters, while offering very little specialized medical training. This was believed to be the result of a doctrine introduced by Gen. Dr. Felicjan Sławoj Składkowski, according to which *a military doctor should first and foremost be a good officer, and only afterwards a "sawbones"*. (...) Moreover, after completing their education and training at the Sanitary Training Center, young military doctors were sent to line units *and only very few had the opportunity for brief specialization in hospitals, which in most cases did not provide adequate conditions for their professional development* [9]. By contrast, it was not uncommon for mobilized reserve doctors to possess extensive clinical experience gained from hospital work, often with specializations and even academic titles. Their

Figure 1. Until 1939, the principal institution for training professional medical service officers (physicians, dentists, pharmacists) was the Sanitary Training Centre located in Warsaw's Ujazdów district. In peacetime, career officers covered most of the army's medical needs. However, the wartime expansion of medical service structures required the mobilization of hundreds of professionals who ordinarily worked in the civilian health system. This mobilization, amid the severe shortage of medical personnel in the Second Polish Republic, further depleted the already limited resources of hospitals, pharmacies, and outpatient clinics. Photograph: Ceremonial oath at the Sanitary Training Center. Source: National Digital Archives

military ranks, however, were disproportionately low compared with their professional qualifications – some held non-commissioned officer ranks such as corporal or sergeant "with census" (i.e. with educational credentials).

When discussing the personnel potential of the broadly understood medical services, it is also essential to consider the resources of the Polish Red Cross (PCK). According to the regulation issued by the President of Poland, the organization's primary purpose was to *cooperate with military-sanitary institutions in wartime and to prepare for such cooperation in peacetime* [10]. In accordance with its statute, the tasks of the Polish Red Cross during war included providing aid and care to soldiers injured as a result of military operations (both from allied and enemy armies), supporting prisoners of war, keeping casualty records, and assisting civilians affected by armed conflict. The organization's potential could also be used in peacetime, for example during natural disasters and epidemics [11]. Its reach and capabilities were considerable. In 1939, the number of adults affiliated with its 17 districts exceeded 300,000, in addition to nearly 450,000 young people [12, 13]. The PCK conducted training for the civilian population and for state institutions, prepared sanitary posts and medical supply depots, and organized rescue and sanitary teams. From the perspective of the military medical service, one of the organization's most important roles was the training of nursing personnel who, in times of crisis, were expected to reinforce military hospitals. The organization operated two nursing schools: in Warsaw and Poznań. In 1939, the PCK Health Service Sisters' Corps numbered over 700 nurses, more than half of whom were graduates of these schools [13].

Hospital facilities

The situation of hospital infrastructure was equally unfavorable. In 1938, Poland had 677 hospitals with a total of 74,999 beds, which corresponded to a ratio of 21.7 beds per 10,000 inhabitants. By this measure, Poland was also at the bottom of the European ranking (see Tab. 3). At the same time, there were marked disparities between different regions of the country (see Tab. 4). In the west (Pomorskie, Poznańskie, Łódzkie, Kieleckie, Śląskie, and Krakowskie Voivodeships) which were the first to be exposed to German occupation, 46.7% of all hospitals and as many as 56.3% of beds were concentrated. When the northern voivodeships directly exposed to an attack

Table 3. Number of hospital beds per 10,000 inhabitants in selected countries. Source: Mały Rocznik Statystyczny/Concise Statistical Yearbook [5]

Country	Year	Number of beds per 10,000 inhabitants
Germany	1936	98.2
Canada	1936	93.7
Australia	1935	84.2
Norway	1936	84.0
Austria	1936	77.3
Sweden	1936	76.1
Denmark	1936	65.8
Latvia	1937	65.2
Finland	1937	63.7
Czechoslovakia	1936	54.0
Hungary	1936	53.2
France	1933	30.2
Soviet Union	1934	28.0
Poland	1938	21.7
Bulgaria	1936	19.8
Greece	1935	19.4
Yugoslavia	1936	18.1
Lithuania	1937	16.3

Table 4. Civilian hospitals in Poland by voivodeship (as of 1938). Source: Mały Rocznik Statystyczny/Concise Statistical Yearbook [5]

Voivodeship	Number of hospitals (% of total)	Number of beds	
		Overall (% of total)	per 10,000 inhabitants
Białostockie	34 (5,0%)	2,333 (3.1%)	12.9
Kieleckie	42 (6,2%)	3,224 (4.3%)	10.1
Krakowskie	48 (7,1%)	8,167 (10.9%)	32.7
Lubelskie	39 (5,8%)	2,812 (3.7%)	10.5
Lwowskie	31 (4,6%)	6,243 (8.3%)	18.6
Łódzkie	51 (7,5%)	5,584 (7.4%)	19.8
Nowogródzkie	18 (2,7%)	625 (0.8%)	5.4
Poleskie	16 (2,4%)	852 (1.1%)	6.8
Pomorskie	35 (5,2%)	5,541 (7.4%)	47.0
Poznańskie	85 (12,6%)	9,540 (12.7%)	42.1
Stanisławowskie	20 (3,0%)	1,359 (1.8%)	8.6
Śląskie	55 (8,1%)	10,174 (13.6%)	72.9
Tarnopolskie	14 (2,1%)	1,035 (1.4%)	6.1
Warszawa (miasto)	63 (9,3%)	8,045 (10.7%)	63.5
Warszawskie	58 (8,6%)	5,867 (7.8%)	21.4
Wileńskie	37 (5,5%)	2,506 (3.3%)	18.6
Wołyńskie	31 (4,6%)	1,092 (1.5%)	4.8
Razem	677 (100%)	74,999 (100%)	21.7

from East Prussia (i.e. Warszawskie and Białostockie) are included, the share of hospitals and beds increases to 60.3% and 67.2%, respectively In the eastern regions (Wileńskie, Nowogródzkie, Poleskie, Wołyńskie, Tarnopolskie, Stanisławowskie Voivodeships), which in the event of conflict with the Third Reich could have served as rear-area hospital facilities, there were 136 permanent hospitals, accounting for only 9.9% of all beds [5].

The problem lay not only in the number of hospitals and the beds they contained. A large proportion of civilian medical facilities, particularly in rural areas, were poorly equipped and had very limited staff. Hospitals employing only one or two physicians were not uncommon. Some of these facilities lacked analytical laboratories and X-ray equipment. The inability to perform X-rays hindered – and in some cases completely prevented – procedures to remove foreign bodies such as bullets and shrapnel. An example can be found in the Łódzkie Voivodeship, where a review of civilian hospitals conducted in the period preceding the war revealed that hospital care in the counties was inadequate (see Tab. 5). In some cases, such as the hospital in Końskie, it was explicitly noted that it was "primitive in its arrangements". A major drawback of the hospital building was heating by tiled stoves. Moreover, it was not the only hospital in the province that lacked central heating [14, 15].

According to the report of Col. Dr. Jan Mintowt-Czyż, head of the Technical-Medical Division of the Department of Health of the Ministry of Military Affairs, cooperation in the period preceding the war between the Ministry of Social Welfare, which oversaw civilian hospitals, and the Ministry of Military Affairs left much to be desired. In his assessment, only a small portion of civilian hospitals could serve as a base for the development of military hospitals, and the civilian health service was not prepared for war [16]. This evaluation was shared by Col. Dr. Wincenty Babecki, deputy director of the Department of Health Service of the Ministry of Social Welfare. In a report prepared after the evacuation to France, he clearly indicated that the civilian health service had not been prepared for war.

Table 5. Civilian hospitals in selected poviats of the Łódzkie Voivodeship. Compiled by the author based on: CAW [14, 15]

Poviat	Number of hospitals	Hospital	Beds (standard – maximum)	Personnel					Wyposażenie			Assessment of hospital care in poviat*
				Equipment	Pielęgniarki	Felczerzy	Akuszerki	Siostry zakon.	RTG	Laboratorium	Diatermia	
Łaski	3	Łask – Szpital Powiatowy	50–75	1	4				Yes	Yes	Yes	Generally inadequate
		Pabianice – Szpital Miejski	94–120	2	5	1	1		No	No	No	
		Pabianice – Szpital Ubezp. Społ.	92–120	2	6	1	3		Yes	Yes	Yes	
Wieluński	1	Wieluń – Szpital Wszystkich Świętych	90–120	2					Yes	Yes	No	Very inadequate
Skierniewicki	1	Skierniewice – Szpital Powiatowy św. Stanisława	80–85	3					Yes	Yes	No	Inadequate
Sieradzki	3	Sieradz – Szpital Powiatowy św. Józefa	75–100	3	0		1	5	Yes	Yes	Yes	Inadequate
		Zduńska Wola – Szpital Miejski	25–40	1	3				No	No	Yes	
		Warta – Szpital Psychiatryczny	450–500	4	8				No	No	No	
Łowicki	1	Łowicz – Szpital Św.	80	2					Yes	No	Yes	Inadequate
Kutnowski	1	Kutno – Szpital Powiatowy Św. Walentego	107–120	4					No	No	No	Inadequate
Konecki	1	Końskie – Szpital Powiatowy Związku Komunalnego	50–80	2					Yes	Yes	No	
Piotrkowski	3	Piotrków Trybunalski – Szpital Św. Trójcy	120–150	3					Yes	Yes	No	Inadequate
		Piotrków Trybunalski – Szpital Ubezpieczalni Społecznej	80–150	2					No	Yes	No	
		Piotrków Trybunalski – Szpital Żydowski imienia Salomei i Markusa małżonków Braun	60–80	2					Yes	Yes	No	
Brzeziński	2	Tomaszów Mazowiecki – Szpital Miejski	125–150	2					Yes	Yes	Nie	Inadequate
		Brzeziny – Szpital Komunalny	50–55	2					No	No	Nie	

* Ocena oryginalna sporządzona przez autorów dokumentów

Table 6. Permanent military hospitals in 1939. Compiled on the basis of: CAW [23], IPMS [16, 22]

Hospital	Town/City	Beds	Notes
Town/City	Beds	800	
Beds	Notes	120	
Notes	Warsaw	900	New building under construction
2. Regional Hospital	Chełm	300	
Branch No. 2 of the Regional Hospital	Lublin	100	
3. Regional Hospital	Grodno	400	Under renovation
4. Regional Hospital	Łódź	500	New building
5. Regional Hospital	Kraków	700	Under renovation and expansion
6. Regional Hospital	Lwów	700	Under renovation and expansion
7. Regional Hospital	Poznań	500	Renovated and expanded
8. Regional Hospital	Toruń	400	Renovation and expansion in the design phase
Branch No. 8 of the Regional Hospital	Grudziądz	200	
9. Regional Hospital	Brześć nad Bugiem	500	Renovated and expanded
10. Regional Hospital	Przemyśl	500	
Military Hospital of the Fortified Area	Wilno	500	Renovated and expanded
Garrison Hospital	Równe	150	Renovated and expanded
Garrison Hospital	Radom	100	New building, intended to serve as a surgical center in wartime

As he noted, in the period preceding the war, military representatives were fostering the mistaken belief that the armed forces *would not rely on civilian hospitals except in a few cases of combat within defensive areas, and that the military itself would organize its own war hospitals. This position was highly inconvenient for the Ministry of Social Welfare, as it deprived the ministry of an important argument in pressing local governments and social insurance institutions for the expansion of hospitals. Such a stance was (…) confirmed even before the outbreak of the war by Col. Laski, head of the Mobilization Department of the Health Service of the Ministry of Military Affairs* [9]. If Babecki's words are true, then the attitude of the leadership of the military health service can be regarded as short-sighted, or even ignorant. Another matter is that civilian hospitals were instructed to prepare plans for a substantial increase in the number of beds in the event of war (by 40–100%). However, the lack of allocated funds for this purpose, combined with already difficult material, equipment, and staffing conditions, meant that the chances of implementing these plans were minimal [17].

The condition of military hospitals was considerably better (see Tab. 6). In 1939, the armed forces possessed a total of ten regional hospitals. These were large, generally multi-specialty centers with several hundred beds, equipped with surgical wards, their own pharmacies, laboratories, and X-ray departments. The largest of these – the First Regional Hospital in Warsaw – had 900 beds. Most of the regional hospitals had been renovated and expanded, or were undergoing such work at the time. The most modern facility, newly constructed and commissioned in 1937, was the Fourth Regional Hospital in Łódź. Equally impressive, by Polish standards, was the School Hospital of the Sanitary Training Center, which served not only clinical and educational functions but was also a leading scientific center of the military health service. Warsaw additionally hosted a smaller, but nationally unique, clinical unit – the Institute of Traumatic Surgery. Smaller military hospitals operated in Wilno, Radom, and Równe. In addition to permanent hospitals, the army had five seasonal hospitals, several garrison infirmaries with dozens of beds each, a number of smaller infirmaries, and sanatoria. It can be estimated that on the eve of war, the military healthcare service had roughly 9,000 beds across hospitals and sanatorium facilities. These estimates do not include field hospitals, which were planned to be established as part of mobilization efforts.

Material and equipment capacity

In 1939, Poland had 487 establishments producing medicines and therapeutic agents [18]. These included, among others, critically important agents for treating the wounded, such as analgesics including morphine, ether for anesthesia, hexobarbital (an intravenous general anesthetic), and circulatory stimulants such as nikethamide and nicotine (see Tab. 7).

Domestic pharmaceutical production covered approximately 75% of national demand for medicines [18, 19]. This statistic, however, requires several caveats. First, access to healthcare in prewar Poland was limited, so actual demand for pharmaceuticals was relatively low. Second, these figures reflect peacetime conditions, not the dramatic surge in demand that occurs during full-scale armed conflict. Third, pharmaceutical production in Poland was largely dependent on imported substrates and semi-finished products. Notably, the main supplier of chemical and pharmaceutical preparations was, in fact, Germany [5]. Fourth, the geographic distribution of pharmaceutical plants was unfavorable. More than 53% of all enterprises were concentrated in the Łódzkie and Warszawskie Voivodeships. Around 21% were located in the western

Table 7. Selected medicines important for aiding the wounded in military operations, produced in Poland before the outbreak of World War II. Compiled by the author based on: Kikta [18], Wytwórczość chemiczna w Polsce [33], Łowicki i Breitman [34]

Agent	Trade name	Intended use	Manufacturer
Diethyl ether		Inhalation anesthetic	Fabryka Chemiczno-Farmaceutyczna "Elit", Warszawa
			Zakłady Chemiczne "Synthesa" Sp. z o.o., Warszawa
			Spółka Akcyjna dla Przemysłu Chemicznego w Łańcucie
Hexobarbital	Sennarcol	Intravenous anesthetic	Przemysłowo-Handlowe Zakłady Chemiczne Ludwik Spiess i Syn S.A., Warszawa
Morphine		Opioid analgesic	Warszawskie Towarzystwo „Motor" S.A.
			Polska Spółka Wyrobów Chemicznych „Roche" S.A., Warszawa
Pantopon	Pantopon Roche	Mixture of opium alkaloids with analgesic and antispasmodic effects	Polska Spółka Wyrobów Chemicznych „Roche" S.A., Warszawa
Procaine	Polocaina	Local anesthetic	Przemysłowo-Handlowe Zakłady Chemiczne Ludwik Spiess i Syn S.A., Warszawa
Nikethamide	Corpyrin	Cardiovascular stimulant	Chemiczno-Farmaceutyczne Zakłady Przemysłowe F. Karpiński S.A., Warszawa
	Stiminol		Przemysłowo-Handlowe Zakłady Chemiczne Ludwik Spiess i Syn S.A., Warszawa
Caffeine		Stimulant of the nervous and cardiovascular systems	Mokotowska Fabryka Chemiczno-Farmaceutyczna A. Gąsecki i Synowie S.A., Warszawa Fabryka Chemiczno-Farmaceutyczna „Geo" S.A., Warszawa Towarzystwo Przemysłu Chemiczno-Farmaceutycznego Magister Klawe S.A., Warszawa Fabryka Chemiczno-Farmaceutyczna AP Kowalski S.A., Warszawa Fabryka Chemiczno-Farmaceutyczna B. Krogulecki, Warszawa Fabryka Chemiczna „Pharmedia" Sp. z o.o., Warszawa Przemysłowo-Handlowe Zakłady Chemiczne Ludwik Spiess i Syn S.A., Warszawa
Acetylsalicylic acid	Motopirin	Analgesic and anti-inflammatory drug	Warszawskie Towarzystwo „Motor" S.A.
Sulfonamides	Septazin	Bacteriostatic chemotherapeutics	Przemysłowo-Handlowe Zakłady Chemiczne Ludwik Spiess i Syn S.A., Warszawa
	Antistreptin		Fabryka Chemiczno-Farmaceutyczna „Geo" S.A., Warszawa

provinces (Silesia, Greater Poland, and Pomerania), while roughly 20% were in southern voivodeships (Krakowskie and Lwowskie). In the eastern provinces, fewer than 6% of pharmaceutical enterprises were active [18]. Consequently, occupation of the industrialized western regions would have severely disrupted domestic drug production. Fifth, up to 30% of the capital of pharmaceutical enterprises came from foreign sources [19].

A major achievement, however, was Poland's independence from imported sera and vaccines, which were produced in several domestic facilities. Among the largest were the Vaccine and Serum Production Plant of the Magister Klawe Chemical-Pharmaceutical Society S.A. and the Serum and Vaccine Production Division of the National Hygiene Institute. Before the war, efficient domestic production even allowed for partial export of surpluses abroad [20]. Yet here too a caveat is necessary. The statistics refer to peacetime conditions. The problem became apparent when, in the period preceding the war, the military requested increased production. This occurred only after an analytical-coordination conference organized in August 1939 by the Department of Health of the Ministry of Military Affairs, with the participation of staff from the National Institute of Hygiene and representatives of Magister Klawe S.A. At that time, it became clear that existing stocks of anti-tetanus and anti-gangrene sera were so low that they would likely be insufficient to meet the needs of not only the civilian population but even the armed forces. The decision was therefore made to maximize production as much as possible. The challenge was that serum preparation took approximately six months [20].

Poland also produced disinfectants. In 1938, 15 plants supplied more than 1,000 tons of these agents. Considerable capacity also existed in the production of dressings, which were manufactured by several dozen companies. Surgical sutures (both silk and catgut) were produced on a much smaller scale. For bioabsorbable (catgut) sutures,

the quality of domestic raw material – lamb intestines – was low. Consequently, domestic production covered only about half of the prewar demand for this category, with the remainder imported from abroad [18, 19]. High-quality surgical instruments were manufactured domestically (produced in three factories: A. Mann, J. Jodłowski, and Olszewski), as well as X-ray machines and related equipment (including products by Rurix, the Borkowski Brothers' manufacturing plants, and the companies operated by Feliks Walknowski and Jan Babicki).

A key issue in preparing for the treatment of casualties in a potential military conflict was the organization of a blood donation and transfusion system. Polish experts, however, did not reach a consensus on which transfusion method – direct donation or indirect transfusion using blood preserved in bottles – offered greater practical value in wartime conditions. This question periodically fueled intense debate among military physicians. Without going into technical detail, it should be noted that establishing a blood transfusion system was an enormous challenge. A system based on direct transfusion, in which blood is transferred from donor to recipient at the bedside, required a pool of potential donors located near transfusion centers and hospitals – an obvious difficulty under wartime circumstances. The alternative method, using preserved blood, required a network of donation points, laboratories, adequate supplies of bottles and preservatives, and refrigerators for storage. It also depended on the ability to transport blood under appropriate conditions, which represented a significant limitation in the Polish context. On the eve of the Second World War, centers specializing in transfusion medicine existed only in larger cities, mostly attached to hospitals (among them Warsaw, Lwów, Kraków, Poznań, and Gdynia). Notably, since 1936 the Central PCK Hospital in Warsaw had operated the Institute of Blood Transfusion and Preservation. A second PCK blood donation center functioned at the Emergency Station in Łódź [21]. In the context of the scale of the conflict that broke out on 1 September 1939, however, the potential of the above-mentioned centers was but a proverbial "drop in the ocean of needs".

Although Poland's capacity to manufacture pharmaceuticals and other medical supplies did not appear small, the country's overall financial weakness weighed heavily on its actual material potential in this field In the months immediately preceding the outbreak of the war, civilian hospitals were expected not only to increase the number of available beds but also to prepare several months' worth of sanitary materials and medicines. The problem was that they received no funding for this purpose, which meant that either the task could not be carried out at all, or the amount of stockpiled supplies was far from sufficient [17]. A similar problem affected the military health service. As noted by Col. Dr. Jan Mintowt-Czyż in a report written already in exile: *Since the Ministry of Military Affairs did not allocate appropriate credits for the purchase of mobilization sanitary supplies (these credits were only obtained in the last few years), they had to be arranged independently. To achieve this, part of the so-called subsistence credits was used, and savings were introduced in everyday expenditures…* [22]. Cutting current expenses was not the only way to secure funds for sanitary equipment. Another was the commercial activity of military hospitals, which offered paid medical services to civilians. According to Col. Mintowt-Czyż, *fees collected from these patients were allocated to the so-called renewal of the Department of Health credits and were directed almost exclusively toward the purchase of mobilization medical equipment. In the final years before the war, these renewed credits amounted to around one million zloty annually* [22]. The state budget was also partially relieved by a decision requiring private pharmacies and those belonging to the Social Insurance Institution to maintain specific reserves of sanitary materials. Yet here too, private pharmacies, lacking additional funds earmarked for this purpose, faced major difficulties in fulfilling the requirement [17].

The sanitary supplies of the Polish Army were stored primarily in two central depots: the Main Sanitary Depot No. 1 in Warsaw (Powązki) and the Main Sanitary Depot No. 2 in Przemyśl. Both were directly subordinate to the Sanitary Supply Directorate, headquartered in Warsaw and headed in 1939 by Lt. Col. Pharm. Tadeusz Moszczeński. The Warsaw depot had greater capacity and a more developed organizational structure. In addition to the Field Equipment and Materials Storage Division and the Current Supplies Storage Division, it also operated a pharmaceutical processing unit. The warehouses stored, among other supplies, medicines, sera and vaccines, laboratory glassware, dressings, field sanitary equipment, dental materials, as well as spare disinfecting and sterilizing instruments [23]. The depot in Przemyśl essentially functioned only as a distribution station, since it received sanitary materials from the Warsaw depot at Powązki and was entirely dependent on it.

The quantities of sanitary materials accumulated in both depots were a cause for concern, particularly with regard to selected items such as medicines, sera and field medical equipment. For example, the Warsaw depot had only 43,000 ampoules of tetanus serum and 40,000 ampoules of gas gangrene serum, while the Przemyśl depot had no serum reserves at all. The scale of these shortages becomes fully apparent only when considering that at least one ampoule of tetanus serum and two ampoules of anti-gangrene serum were required for each wounded soldier [20].

After the campaign, the head of the receiving center of the Main Sanitary Depot No. 1, Capt. Dr. Pharm. Stanisław Brzeziński, assessed the situation as follows: *The Military Sanitary Depot in Warsaw at Powązki was not adequately supplied with sanitary materials for wartime. There was too little dressing material and too few prophylactic sera (…) it may be assumed that, in the pre-war period, the pace of sanitary material procurement was not significantly increased* [24]. Maj. Pharm. Kazimierz Butler, who headed the Current Use Department of the same institution, reported: *I drew Col. Moszczyński's attention to the fact that we were not producing a larger number of personal dressings – the answer was always the same: we have no money* [25]. In another document he noted: *The reserves for mobilization were minimal. Only in August of this year* [1939 – author] *did the order come that a certain amount of sanitary material from current use was to be set aside, but this reserve was also very insufficient* [26]. Equally poor were the reserves accumulated in the Main Sanitary Depot No. 2 in

Przemyśl, as indicated by the deputy manager of the depot, Capt. Pharm. Tadeusz Kulig [27]. Similar conclusions, though not based on his own experience but on collected accounts, were reached by Maj. Dr. Henryk Mazanek. In his study on the activities of the medical service during the 1939 campaign, he wrote: *Despite the fact that only two sanitary depots were planned for wartime, the amount of materials stored in them was relatively small. (...) In the department of current-use materials, the depots did not hold larger quantities of sanitary supplies, because they had just completed distributing materials to units according to the allocation list (...) the purchasing office had not yet managed to procure new materials, and as a result the depots' current-use warehouses did not contain even the quantities that should have been accumulated under existing regulations, and which were intended to cover a six-month supply for the peacetime army. The quantities set aside for mobilization were also small, because it was only in 1939 that the Health Department issued orders reserving certain amounts of sanitary material for mobilization. In the Main Sanitary Depot No. 1 in Warsaw, only dressing material was stockpiled in larger quantities* [20].

A certain stock of sanitary materials was held by military pharmacies, which operated within all permanent military hospitals, selected seasonal hospitals, and some sanatoria. However, pharmacies primarily secured the current needs of hospitals and infirmaries and could not be treated as sources of supply for field units.

While the supply and equipment of permanent military hospitals in peacetime raised no objections, the quality and quantity of equipment intended for mobilized field units left much to be desired. The bodies mobilizing health service units were primarily the reserve cadres of regional hospitals. However, they did not possess the necessary reserves to equip the mobilized units adequately. Col. Mintowt-Czyż noted: *The supply of hospitals with equipment according to the mobilization plan had to come from purchases or requisitions, and this was a complete fiction – the hospitals did not possess such essential items as autoclaves and X-ray machines. Quartermaster equipment did not exist at all* [22]. Equally alarming was a letter from the army inspector, Lt. Gen. Mieczysław Norwid-Neugebauer, dated 12 June 1939, concerning sanitary equipment: *During many years of inspections and observations at inter-divisional exercises, I found that the wartime equipment intended for the medical service units of large formations did not meet requirements, both in terms of quality and, in many cases, equipment design* [28]. However, there were also positive examples. One noteworthy case was the high quality of domestically produced field surgical kits, which were widely praised. Some physicians even remarked that they were overly elaborate.

As mentioned earlier, civilian pharmacies were also expected to play a role in supplying military medical units during wartime operations. On 27 March 1939, the Ministry of Social Welfare issued a directive requiring pharmacies to maintain strictly defined quantities of selected medicines and medical supplies [29]. In subsequent months, minor modifications were introduced to the list, which ultimately comprised more than 60 items. These included, among others, 2 kg of ether for anesthesia, 2 kg of chloroform for anesthesia, 100 ampoules of procaine for infiltration anesthesia, 5 kg of 95% alcohol, 400 ampoules of morphine, 10 vials of tetanus antitoxin, 5 vials of gas-gangrene antitoxin, 50 individual dressings, 200 bandages, 25 kg of cotton wool, and – interestingly – 40 liters of oxygen in cylinders [30]. Altogether, in 1938 Poland had 2,310 pharmacies [5]. In theory, they constituted a significant logistical resource. Unfortunately, it has not been established to what extent the directives on mandatory reserves were actually implemented. It should also be noted that the continuity of pharmacy operations under wartime conditions was adversely affected by the planned mobilization, which encompassed a considerable proportion of their personnel, including pharmacists.

The Polish Red Cross (PCK) also maintained reserves of sanitary materials. These were stored in the Main PCK Depot in Warsaw as well as in smaller district and branch depots.

Means of transport and medical evacuation

The problem of insufficient motorization within the Polish Army also affected the medical service. This was evident both in the inadequate number of motor vehicles and in their poor quality. For this reason, horse-drawn wagons remained the primary means of medical evacuation at the tactical level. A large portion of these consisted of old and heavily worn supply wagons, model 19. Plans also envisaged the widespread use of requisitioned peasant carts for medical evacuation. Most of these had no suspension, and their only "adaptation" for medical use consisted of lining the wagon bed with straw. Under such conditions, severely wounded soldiers were condemned to painful and exhausting journeys over rough, uneven roads. Another issue concerning some of the medical horse-drawn wagons was highlighted by Gen. Norwid-Neugebauer, who pointed out that *wheeled transport vehicles of foreign types are too heavy for our terrain and road conditions and for our draft animals, and moreover the wheel spacing, much wider than in our domestic wagons, does not match the ruts of our dirt roads* [28].

Most of the ambulances available to the Polish Army in 1939 had been purchased from the budget of the Polish Red Cross (PCK) (Fig. 2). According to estimates by Col. Dr. Babecki, the number of vehicles supplied by this organization in the years preceding the war amounted to approximately 200 [9]. The PCK ambulances were grouped into medical motor columns, which were placed under the administrative and technical authority of individual armored battalions. According to mobilization plans, these battalions were to form a total of 17 medical motor columns, including 14 PCK columns [31]. Such a number of sanitary car columns allowed their use primarily at the operational level, with individual field armies able to count on the allocation of at most one or two of them. The number of ambulances was so small that neither of the two motorized brigades of the Polish Army received its own sanitary column or even a motorized sanitary platoon. It is enough to mention that the entire 10th Motorized Cavalry Brigade, with a total strength of about 5,000 personnel and more than 1,100 vehicles, possessed only 20 ambulances.

Figure 2. Although the photograph might suggest otherwise, the degree of motorization in the Polish Army was lamentably low. This was especially true for motor ambulances, whose shortage became particularly evident in September 1939. Most ambulances had been purchased with funds from the Polish Red Cross (PCK). However, these vehicles were subordinated to military structures (primarily armored battalions) responsible for their maintenance and operation. Photograph: Ceremony of handing over new ambulances by the Polish Red Cross. Source: National Digital Archives

However, the medical service struggled not only with the low number of motor vehicles. The Zaolzie operation, carried out in the autumn of 1938 as a kind of test and training ground for the Polish Army, revealed that the technical condition of the sanitary vehicles involved left much to be desired. Although no direct clash with the Czech side occurred and the sanitary column assigned to the "Silesia" Operational Group essentially remained in reserve, the operation exposed the structural shortcomings of the ambulances. One report noted: *The assigned sanitary vehicles frequently broke down, struggling to cope with greater demands. The main cause seems to be their construction. Heavy bodies were mounted on light passenger-car chassis with heavy axles and a weak, delicate engine, making it impossible to expect the performance of a truck. The most common defects concerned the gear transmission* [32].

Given the generally low level of motorization in the country, the possibilities of acquiring improvised evacuation means by requisitioning civilian vehicles were very limited. It was assumed that in larger cities it would be possible to take over and adapt buses for this purpose. However, this solution was feasible only in urban centers with an adequate fleet, such as Lwów, Gdynia, and Katowice.

Given the above circumstances, as well as the experience gained during the Polish–Bolshevik War, rail transport held a special place in Polish medical doctrine and the medical evacuation system. Hospital trains were organizationally divided into permanent (kept in readiness), semi-permanent (with reduced staffing), and improvised units. The "American-type" trains, dating back to the previous war, consisted of 16 carriages with a total capacity of 360 lying patients. The "Polish-type" trains comprised 30 carriages and could transport 150 bedridden and 100 seated patients. Mobilization plans envisaged the use of 36 permanent and semi-permanent trains [31]. Although the nominal number of trains and their patient-transport capacity appeared impressive, preparing them to effectively fulfill their tasks proved highly challenging. The Ministry of Communications was responsible for assembling the train sets, while reserve staff from regional hospitals were expected to supply sanitary and quartermaster materials. The previously described problems with medical supply also affected the trains [20]. It is worth noting that medical trains were inextricably linked to railway lines. The railway network in the Second Polish Republic, particularly in areas of the former Russian partition, was inadequately developed. Thus, evacuation routes for the wounded were determined by railway lines, which created considerable logistical and organizational difficulties for the medical service.

Against the backdrop of the above-mentioned capacities and limitations of Polish healthcare, the potential of domestic air ambulance services was, in practice, negligible. The fleet of around 30 medical aircraft, including the Lublin R-XVIb and RWD-13S, performed very well during peacetime in transporting critically ill patients – though only individually – from remote regions of the country to specialist centers in larger cities. However, in the event of a full-scale conflict, they could in no way influence

Figure 3. Every ceremony for the handover of a new medical aircraft was carried out with great pomp and widely publicized in the media. This, however, did not change the fact that a fleet of approximately 30 RWD-13S and Lublin R.XVIb medical planes had very limited potential in the event of a full-scale armed conflict. The RWD-13S could carry only one patient at a time, while the R.XVIb could carry two. Photograph: Ceremony for the handover of a new RWD medical aircraft at the Kraków Błonia. Source: National Digital Archives

the overall situation (Fig. 3). A Lublin R-XVIb could carry two wounded patients on stretchers at a time, while an RWD-13S could carry only one. Theoretically, several Fokker F-VII transport planes and aircraft belonging to the "Lot" airline could be adapted for evacuation purposes.

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