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NATIONAL UNIVERSITY OF PHARMACY
pharmaceutical faculty
department of management, marketing and quality assurance in pharmacy

QUALIFICATION WORK

on the topic: «**Analysis of the experience of operating mobile pharmacies in different countries»**

Prepared by: higher education graduate of group Phm20(4,10д)eng-02
specialty 226 Pharmacy, industrial pharmacy
educational and professional program Pharmacy
Mohamed LAGZOULI
Supervisor: associate professor of higher education institution of department of management, marketing and and quality assurance in pharmacy, PhD,
associate professor Svitlana ZHADKO
Reviewer: professor of higher education institution of department of social pharmacy, DPharmSc, professor
Victoria NAZARKINA

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ANNOTATION

The qualification work is devoted to studying the experience of different countries regarding the functioning of mobile pharmacies. The problems of pharmaceutical provision of the population in emergency situations are described, foreign experience in organizing pharmaceutical assistance to the population in remote areas is analyzed, and directions for improving the work of mobile pharmacy points in Ukraine are identified.

The work is presented on 55 pages of printed text and consists of an introduction, three sections, general conclusions, a list of references and appendices. The work is illustrated with 7 figures and 2 tables and contains 31 sources of scientific literature.

Key words: pharmaceutical assistance, organization of pharmacy work, pharmacy network, mobile pharmacy, pharmaceutical service

АНОТАЦІЯ

Кваліфікаційна робота присвячена вивченню досвіду різних країн щодо функціонування мобільних аптек. Описано проблеми фармацевтичного забезпечення населення в умовах надзвичайних ситуацій, проаналізовано зарубіжний досвід з організації фармацевтичної допомоги населенню у віддалених районах, визначено напрями вдосконалення роботи мобільних аптечних пунктів в Україні.

Робота викладена на 55 сторінках друкованого тексту і складається зі вступу, трьох розділів, висновків, списку використаних джерел, додатків. Робота ілюстрована 7 рисунками і 2 таблицями, містить 31 джерело літератури.

Ключові слова: фармацевтична допомога, організація роботи аптек, аптечна мережа, мобільна аптека, фармацевтична послуга

CONTENT

INTRODUCTION

Over the past decades, unstable situations caused by natural disasters have been increasingly observed in many parts of the world. In many countries, the problem of inadequate access to healthcare in remote areas has become critical. Ensuring access to pharmaceutical care and medicines for the population in rural and remote areas, as well as during emergencies, is one of the priority tasks of the healthcare system of every country.

According to statistics, only 11% of Ukrainian villages have pharmacies where you can buy medicines, and residents of more than 20 thousand rural settlements are forced to travel to another city or village for medicines, the distance to which can be tens of kilometers. A particular problem for the population is the purchase of medicines in de-occupied and front-line territories, where pharmacies were absent or destroyed. Therefore, the work of mobile pharmacies can significantly improve pharmaceutical assistance to the rural population and during emergencies.

The purpose of the qualification work is to study the experience of operating mobile pharmacies in different countries of the world.

To achieve the goal set in the qualification work, the following tasks were solved:

– to study and summarize data from scientific literature on the problem of ensuring access to medicines for the population in emergency situations and in remote areas;

– to analyze foreign experience in organizing pharmaceutical assistance to the population in remote areas;

– to conduct a review of additional services of mobile pharmacies abroad;

– to study licensing requirements for the activities of mobile pharmacies in Ukraine;

– to analyze the features of organizing the work of mobile pharmacies in Ukraine;

– to identify areas for improving the work of mobile pharmacies in Ukraine;

– to analyze the economic component and conduct a SWOT analysis of the implementation of mobile pharmacies in Ukraine.

The object of the research is practical implementation of ensuring public access to medicines in emergency situations and in remote areas.

The subject of the study is providing pharmaceutical services to the population in different countries through mobile pharmacies.

Research methods. The methods of desk marketing research were used: statistical data analysis; retrospective analysis; descriptive analysis; generalization; comparison; economic and statistical method; SWOT-analysis. The information base of the qualification work was modern scientific literature; regulatory and legal framework for retail trade of medicines and reimbursement; statistical data.

The practical significance of the results. The results of the study have practical significance for pharmacy chains, government organizations, and international humanitarian organizations when planning and implementing projects to introduce mobile pharmacies in different countries.

Foreign experience in organizing pharmaceutical assistance to the population in remote areas is summarized. Strengths and weaknesses, threats and opportunities for the implementation of mobile pharmacies in Ukraine are identified, recommendations are developed for expanding the list of pharmaceutical services provided by mobile pharmacies and improving their quality.

Approbation of research results and publication. Based on the results of the qualification work, theses were published at the XXXI International Scientifical and Practical Conference of Young Scientists and Students «Topical issues of new medicines development» (April 23-25, 2025) [16].

Structure and volume of qualification work. The work is presented on 55 pages of printed text and consists of an introduction, three sections, general conclusions, a list of references and appendices. The work is illustrated with 7 figures and 2 tables and contains 31 sources of scientific literature.

PART 1

PROBLEMS OF ENSURING POPULATION ACCESS TO MEDICINES IN EMERGENCIES

1.1 The problem of public access to medicines during emergencies

Over the past decades, unstable situations caused by natural disasters, which are often a consequence of global warming, have been increasingly observed in many parts of the world. From time to time, major man-made disasters and large-scale fires occur. A significant factor in instability is the growth of the world's population, which exacerbates the problem of ensuring food security. Global economic shocks regularly occur, inter-national, inter-ethnic and inter-religious conflicts are gaining in intensity, terrorist organizations are formed, which in some places grow into influential movements, frozen conflicts flare up and new armed confrontations appear. The world is increasingly concerned about the threat of nuclear terrorism [11].

In such conditions, the emergence of an emergency situation becomes quite real. Therefore, ensuring the readiness of countries to operate life support systems during crisis circumstances is one of the most priority tasks. In particular, this includes the early development of logistical mechanisms to provide the population with products and services of critical importance. Among the most relevant types of such services, it is worth highlighting pharmaceutical assistance [11].

Analysis of trends in the development of man-made accidents, catastrophes, natural disasters and the forecast of possible dangers shows that at the beginning of the 21st century there remains a high degree of risk of emergencies of man-made, natural and social origin. This is evidenced by a sharp increase in the number of emergencies, the consequences of which in terms of human and material losses can exceed the results of military conflicts.

A special place is occupied by the deployment and functioning of pharmacies in combat zones. In these conditions, the high readiness of relevant state structures for the prevention, rapid response and elimination of the consequences of emergencies is of great importance.

This is especially true for the system of pharmaceutical assistance to the population, which is obliged to organize full, timely and uninterrupted provision of the affected population with medicines of both industrial and pharmacy production. In order to provide effective pharmaceutical services to the affected population, medical units and medical and preventive institutions must be ready to produce a large number and a significant range of extemporaneous medicines in pharmacies deployed in adapted premises in the emergency relief zone. This requires advance preparation for the operational deployment of pharmacies in the emergency zone and their appropriate equipment with technological equipment, moral and psychological preparation of pharmaceutical personnel for work in extreme conditions. Scientific works of recent years are devoted to the study of pharmacoeconomic aspects of pharmaceutical services for victims in emergency situations with burn injuries and poisoning with potent and toxic substances [6].

Analysis of legislative and regulatory legal acts shows that the state provides guarantees for providing the population with medical and pharmaceutical care, both in peacetime and in emergency situations, but they are not fully implemented. This is especially true of the problem of increasing the level of accessibility of the population to effective, safe, high-quality and cheap medicines, which remains relevant and requires a solution [6].

One of the main reasons for this situation was the unconditional focus of pharmacy institutions on ready-made dosage forms and the refusal of pharmacy manufacturing of medicines, which guarantees the quality, safety and accessibility of the patient to the individual dose of the drug prescribed by the doctor in accordance with the prescription. Extemporaneous drugs have a lower cost than industrially produced drugs.

The advantages of extemporaneous drugs, in addition to their availability, include the absence of many excipients that can cause allergic reactions, especially in pediatric patients. Despite the development of the pharmaceutical industry, in the treatment process there are no analogues of many extemporaneous drugs, which are characterized by doctors as effective and safe [6].

Pharmaceutical assistance to the affected population is impossible without the production of a large number and a significant range of extemporaneous drugs in pharmacies deployed in adapted premises in the emergency response zone. However, the requirements of current regulatory legal acts concerning the rules for the production of drugs in pharmacy establishments under normal conditions do not allow their use for the production of drugs in pharmacies deployed in adapted premises during the elimination of the consequences of emergencies of a technogenic, natural, social and military nature.

The possibility of a significant number of affected people at once as a result of various emergencies indicates the need for regulatory and legal regulation and the implementation of regulatory acts concerning the rules for extemporaneous manufacture and quality control of drugs in pharmacies of medical and preventive institutions deployed in adapted premises in emergency response zones [6].

As the experience of liquidating the medical and sanitary consequences of known emergencies shows, due to the destruction of communication routes, disruption of communication, destruction of stocks of industrially produced drugs in the emergency zone, full-fledged pharmaceutical support of medical units of the disaster medicine service and medical and preventive institutions for a long time is excluded. In these conditions, pharmacy production of drugs allows ensuring the continuity and efficiency of emergency medical care and treatment of the affected population.

The historically traditional practice of providing inpatient and outpatient patients with pharmacy-made medicines allows for significantly increasing the efficiency of the treatment process and reducing the treatment time of injured and sick patients due to the efficiency and flexibility of drug supplies in all possible and necessary dosage forms, nomenclature, and volumes for each specific patient - from single complex prescriptions that are rarely found to large series of injection and infusion solutions.

The limited shelf life of extemporaneous drugs is justified by the fact that in emergency situations they do not require long-term storage and transportation from

the manufacturer to the consumer. Extemporaneous drugs are manufactured, as a rule, on the territory of medical institutions immediately before use. In addition, pharmacy-made drugs cannot be completely replaced by industrially produced drugs in the context of emergency response, which is due to a number of reasons:

– for some pharmaceutical drugs, there are no analogues among industrially produced drugs due to the unprofitability of their production, low demand or the impossibility of adequate dosage for newborns, children and the elderly;

– some patients require an individual approach to treatment, while industrially produced drugs are designed for the “average” consumer;

– some pharmaceutical drugs do not have absolutely equivalent industrial analogues due to their instability or short shelf life (10%, 25% glucose solutions, 0.01% dibazole, 1% ascorbic acid; 0.1–0.5%, 2–5% potassium permanganate solutions for use in newborns and treatment of burn surfaces, etc.);

– some industrially produced drugs contain stabilizers and acidity regulators, they cannot be used to treat children under 1 year of age. In addition, only in pharmacies are sterile solutions of novocaine 1% and 2%, calcium chloride 1%, potassium chloride 7.5%, sodium chloride 10%, furatsilin 0.01% and 0.02% in physiological sodium chloride solution (in bottles from 10 to 400 ml), ethacridine lactate 0.1%, dicaine 1%, 2% and 3%, boric acid 2% and 3%, as well as solutions of collargol and protargol 3%, potassium permanganate 0.1%, 5%, 10% (10, 50, 100 and 200 ml each) made under aseptic conditions.

Therefore, it is quite obvious that the preparation of significant quantities of extemporaneous drugs in areas of extreme emergency conditions is impossible without the deployment of pharmacy facilities in adapted premises and the application of the rules of extemporaneous technology for the preparation of medicines.

1.2 Current status and problems of pharmaceutical provision for the rural population in Ukraine

In Ukraine, where almost a third of the population lives in rural areas and most villages do not have stationary pharmacies, about 89% of rural settlements are not provided with pharmaceutical care.

According to the State Service of Ukraine for Medicines and Drug Control, the most pressing problems of pharmaceutical assistance to rural residents include:

– insufficiently developed infrastructure of the rural medical supply system;

– significant remoteness and difficult accessibility of settlements, lack of stable mobile communication;

– low staffing of medical and pharmaceutical personnel and insufficient qualification of specialists;

– predominance of the population with low incomes, as well as people of limited mobility of older age categories [1].

According to government officials, simplifying licensing requirements for pharmacies in rural areas should help open new outlets in villages and increase the availability of medicines for rural residents. Thus, in November 2023, amendments were made to the Licensing Conditions for Conducting Economic Activities in the Production of Medicines, Wholesale and Retail Trade in Medicines, and Import of Medicines (except for Active Pharmaceutical Ingredients) (hereinafter referred to as the Licensing Conditions), which establish simplified requirements for pharmacies in villages.

According to the amendments:

– the area of pharmacies located in villages and urban-type settlements must be at least 30 m^2, the area of the sales hall must be at least 13.5 m2 (in the previous version of clause 168 of the Licensing Conditions – 40 and 18 m^2, respectively);

– the area of pharmacies located in the village must be at least 18 m^2, the area of the sales hall must be at least 6 m^2, the premises for storing medicines must be at least 3.6 m2; the staff room must be at least 2.4 m^2, (in the previous version

of clause 168 of the Licensing Conditions, the minimum area of these premises was 30, 10, 6 and 4 m^2, respectively) [8].

For pharmacies located in villages, the following simplifications of the Licensing Conditions apply:

- it is not mandatory to have a refrigerator in the staff room;

- the positions of head or deputy head of a pharmacy may be held by persons who have a higher education document of not lower than the initial level (short cycle) of higher education in the specialty "Pharmacy, industrial pharmacy" in the absence of work experience in this specialty;

- the duties of an authorized person responsible for the functioning of the drug quality assurance system may be performed by a person who has a higher education document of not lower than the initial level (short cycle) in the specialty "Pharmacy, industrial pharmacy" in the absence of work experience in this specialty [7].

One of the requirements for pharmacies, including in rural areas, is to connect to the electronic health system for dispensing medicines according to electronic prescriptions. According to the National Health Service of Ukraine "Electronic map of places for dispensing medicines according to e-Prescription", as of December 1, 2024, only 1,875 retail outlets in villages dispense medicines according to electronic prescriptions, which is about 9.8% of their total number in all types of settlements (table 1.1) [1].

Table 1.1

Data on the dispensing of medicines using electronic prescriptions in different types of settlements

Type of settlement	Number of pharmacies	Number of pharmacies with a contract under the reimbursement program	Places where medicines are dispensed using electronic prescriptions
City	1922	1017	14973
Big village	877	534	2278
Village	1013	561	1875
All Ukraine	2917	1494	19126

Ukraine is characterized by an uneven density of places dispensing medicines using electronic prescriptions (fig. 1.1), and a particularly low density in rural areas (fig. 1.2) [5].

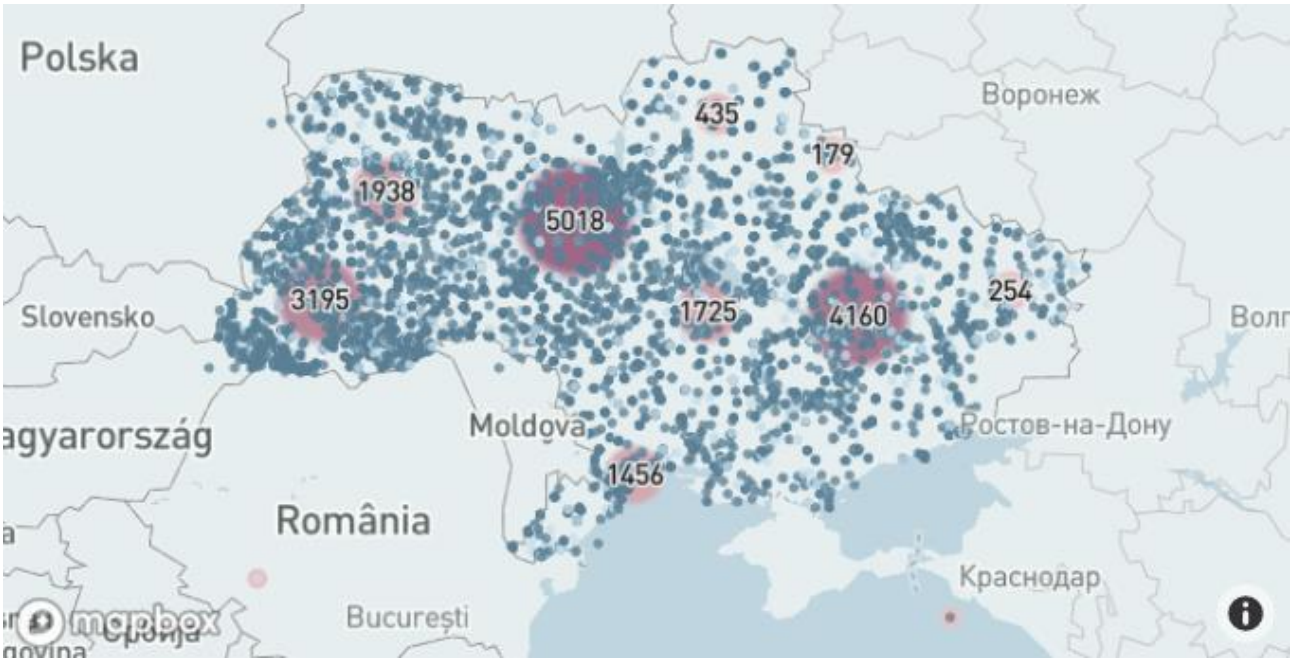

Fig. 1.1 Electronic map of places where medicines are dispensed using electronic prescriptions (all types of settlements)

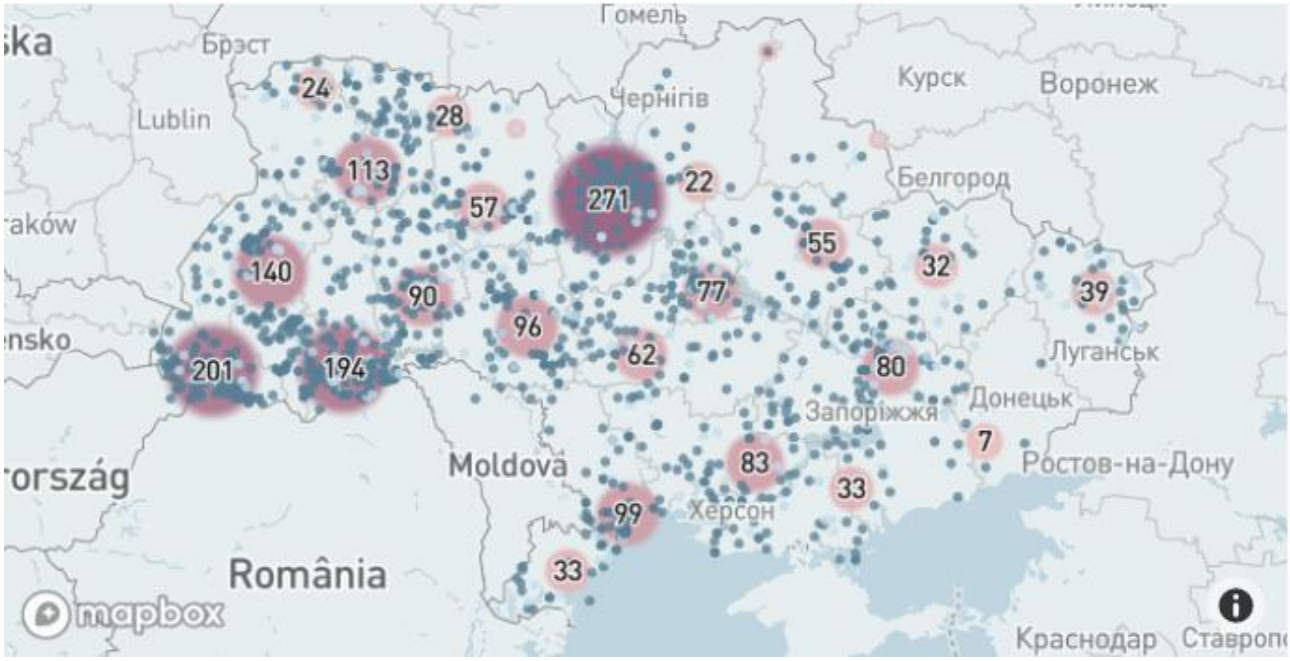

Fig. 1.2 Electronic map of places where medicines are dispensed using electronic prescriptions (villages)

According to the National Health Service of Ukraine, there are 19,126 retail pharmacies operating throughout the country, where medicines are dispensed according to electronic prescriptions, of which 15,621 outlets dispense medicines and medical devices under the “Affordable Medicines” program (fig. 1.3) [5map].

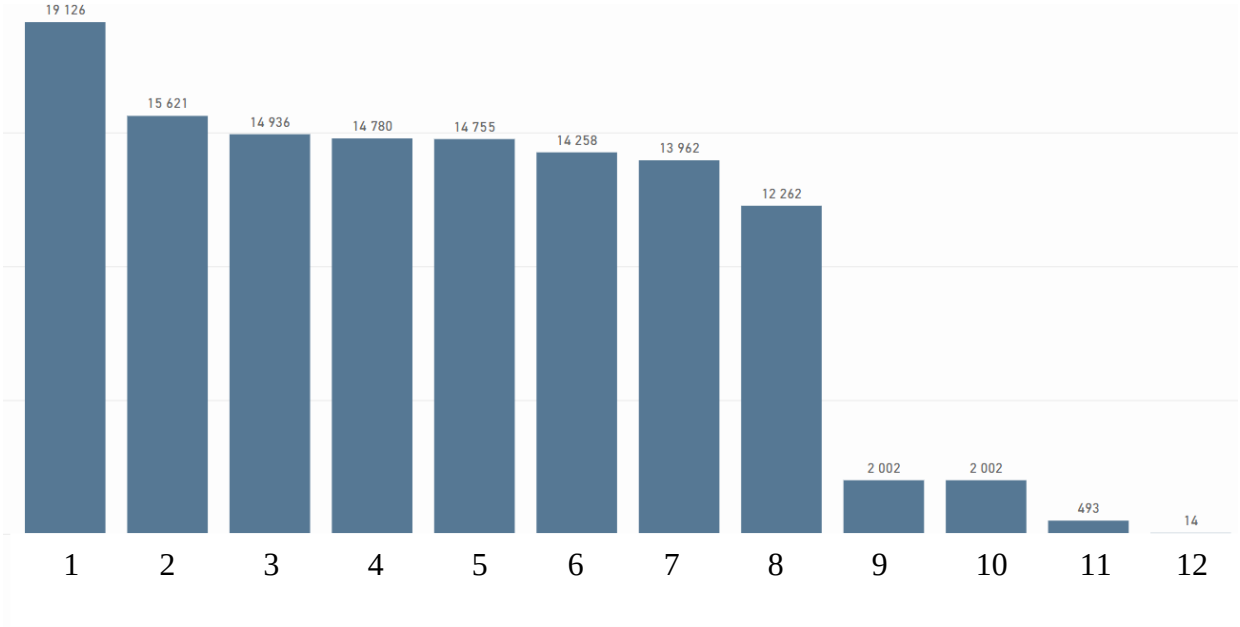

Fig. 1.3 Number of drug dispensing locations under e-prescription programs in all types of settlements*

*1 — prescription drugs; 2 — affordable medicines; 3 — psychiatric behavioral disorders and epilepsy; 4 — Parkinson’s disease; 5 — medical devices for determining blood glucose levels; 6 — diabetes insipidus; 7 — insulin free of charge or with payment, 8 — immunosuppressive drugs; 9 — narcotic (psychotropic) drugs; 10 — narcotic and psychotropic drugs on preferential terms; 11 — opioid analgesics; 12 — drugs based on medical cannabis.

As can be seen from fig. 1.3, the leading categories of drug stores in terms of the number of retail pharmacies are: “Psychiatric behavioral disorders and epilepsy” — 14,936 (3), “Parkinson’s disease” — 14,780 (4), “Medical devices for determining blood glucose levels” — 14,755 (5), “Diabetes insipidus” — 14,258 (6), “Insulin free of charge or with payment” — 13,962 (7), “Immunosuppressive drugs” — 12,262 (8). Only 2,002 retail pharmacies dispense narcotic (psychotropic) drugs (9), including narcotic and psychotropic drugs on preferential terms (10). The smallest number — 493 retail pharmacies dispense opioid analgesics (11) and 14 — drugs based on medical cannabis (12).

The number of drug dispensing points under e-prescription programs in rural areas is much smaller (fig. 1.4). The number of retail pharmacies that dispense narcotic (psychotropic) drugs — 224 and opioid analgesics — 26 is particularly critical [5].

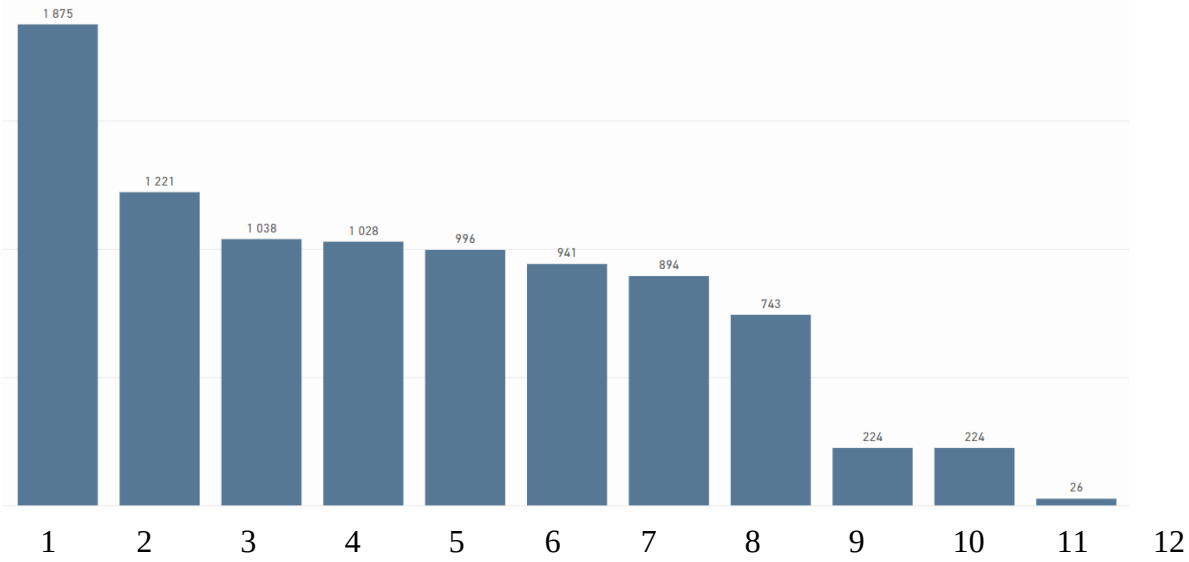

Fig. 1.4 Number of drug dispensing locations under e-prescription programs in rural areas*

*1 — prescription drugs; 2 — affordable medicines; 3 — psychiatric behavioral disorders and epilepsy; 4 — Parkinson's disease; 5 — medical devices for determining blood glucose levels; 6 — diabetes insipidus; 7 — insulin free of charge or with payment, 8 — immunosuppressive drugs; 9 — narcotic (psychotropic) drugs; 10 — narcotic and psychotropic drugs on preferential terms; 11 — opioid analgesics; 12 — drugs based on medical cannabis.

As of May 31, 2024, the National Health Service of Ukraine (NHSU) has concluded reimbursement agreements with 1,356 business entities. 14,699 pharmacies are involved in the "Affordable Medicines" program [5].

One of the criteria for the effectiveness of the "Affordable Medicines" program is the ratio of reimbursed prescriptions to those issued. According to official statistics, in the fourth quarter of 2023, 86 % of electronic prescriptions issued under the "Affordable Medicines" reimbursement program were reimbursed, which at that time was the maximum result since the beginning of the administration of the NHSU program. For example, 98% of prescriptions were

reimbursed in the direction of diabetes insipidus. As for drugs against cardiovascular diseases, type 2 diabetes mellitus and chronic obstructive pulmonary diseases, 17 % of undispensed prescriptions is a result that is worth working on [5].

The problem of accessibility of pharmaceutical care in rural areas of Ukraine remains acute, given the low level of provision of pharmacies, underdeveloped infrastructure, staffing difficulties and low purchasing power of the population. Amendments to the Licensing Conditions are an important step to improve the situation, as they contribute to simplifying the opening of pharmacies in villages and improving access to medicines. However, even with the implementation of these changes, the number of pharmacies in rural areas, especially those that dispense medicines by electronic prescriptions and the "Affordable Medicines" program, remains insufficient.

Summary

1. The increasing frequency of emergencies, including natural disasters, technological accidents, and armed conflicts, highlights the critical role of pharmaceutical assistance in crisis response. The deployment of mobile pharmacies and the ability to produce extemporaneous drugs in emergency zones are essential to ensuring uninterrupted access to life-saving medications.

2. Given the limitations of industrially produced drugs in emergency conditions — such as supply chain disruptions, the need for individualized dosages, and the absence of certain formulations — extemporaneous drug production in adapted pharmacy facilities remains indispensable. Therefore, regulatory frameworks should be adjusted to support the operational deployment of pharmaceutical services in emergency response zones, ensuring rapid, flexible, and effective medical support for affected populations.

3. A significant part of rural settlements in Ukraine does not have stationary pharmacies, which leaves about 89% of villages without proper

pharmaceutical care. This complicates access to medicines for rural residents, especially the elderly with limited mobility.

4. Insufficiently developed infrastructure, the inaccessibility of some settlements and the low level of medical staff are critical problems affecting the provision of medicines in villages. The villages are dominated by a low-income population, which limits the ability to purchase medicines. This exacerbates inequality in access to pharmaceutical services between urban and rural residents.

5. Amendments to the Licensing Conditions for opening pharmacies in villages have become an important step towards increasing their accessibility. However, even after these changes, the number of pharmacies remains insufficient, in particular those operating under the “Affordable Medicines” program and dispensing medicines using electronic prescriptions.

PART 2

ANALYSIS OF FOREIGN EXPERIENCE IN ORGANIZING PHARMACEUTICAL CARE TO THE POPULATION IN REMOTE AREAS

2.1. Foreign experience in improving pharmaceutical care in remote areas

For Ukraine, the work of mobile pharmacies is an innovative approach to ensuring the population's access to pharmaceutical care. At the same time, in a number of countries, appropriate mechanisms for ensuring the population's access to medicines have already been developed and implemented [25].

The WHO report on the regulatory framework for community pharmacies in the WHO European Region notes that in many countries, the problem of inadequate access to healthcare in remote areas has become critical. The report provides a brief overview of pharmacy structures other than traditional pharmacies [28].

In Germany, pharmacies can apply for permission to set up prescription collection points. Such points cannot be located on the premises of commercial companies or in the offices of medical professionals. At these points, patients can leave their prescriptions in a sealed container and then collect their medication from the pharmacy or have it delivered by courier [28].

In Spain, the operation of pharmacy points ("botiquines farmacéuticos" — literally, "pharmaceutical first aid kits") has been allowed since 1944. They can be opened in factories, mines or in production facilities where more than 100 people work, if the distance to the nearest pharmacy exceeds 5 km. As a rule, such pharmacy points are open only a few hours a week and are aimed at serving the local population [28].

In Romania, the legislation allows non-hospital pharmacies to organize local sales points ("oficine locale de distribuție") in areas not covered by pharmaceutical services (mainly in rural areas or in coastal resorts during the summer season).

Such sales points can be established after obtaining a permit, which is revoked when a stationary non-hospital pharmacy opens in that area [4, 28].

In Slovenia, with the permission of the local municipality, pharmacies can create and manage stocks of medicines at doctors' offices located at least 10 km from the nearest pharmacy or pharmacy branch [28].

In Estonia, a pharmacy bus (“apteegibuss”), which operates according to a set schedule, is a structural unit of a pharmacy. The vehicle must display the name of the pharmacy, as well as the schedule, location and time of service. The bus must ensure physical accessibility for patients with musculoskeletal disorders. Pharmaceutical services may be provided via pharmacy buses only in administrative units that are not cities or towns, at least 3 km from a stationary pharmacy or a branch pharmacy. If there is no stationary pharmacy (or branch pharmacy) in a city or town, the pharmacy bus must provide pharmacy services there [4, 28].

In Hungary, a branch pharmacy as a structural unit of a pharmacy can be either stationary or mobile. If a mobile branch pharmacy is established, the state health authority shall specify in the permit a list of settlements that can be served and are territorially closest to the main office of the pharmacy. In this case, the number of people served by the mobile branch pharmacy shall not exceed 4,500 people [4, 28].

In Kazakhstan, the rules for wholesale and retail sale of medicines and medical devices (Order of the Ministry of Health of the Republic of Kazakhstan dated September 17, 2020 No. KR DSM-104/2020) determine that retail sale of pharmaceutical products in remote rural areas can be carried out in mobile pharmacy points organized by the pharmacy [4, 28].

The mobile pharmacy must be located on the chassis of a motor vehicle and be separated from the driver's cabin and passenger seats. It is equipped with cabinets and refrigeration equipment for storing medicines, medical devices, as well as disinfectants and tools for maintaining a sanitary regime.

Qualification requirements include higher or secondary pharmaceutical education for the head of a mobile pharmacy, as well as employees who sell medicines and medical devices. In the absence of specialists with pharmaceutical education, the sale of medicines and medical devices is carried out by specialists with medical education who have passed special certification [28].

In Uzbekistan, a major pharmaceutical distributor is operating mobile pharmacies in remote areas to improve access to essential medicines. On behalf of the government of Uzbekistan, more than 130 mobile pharmacies and pharmacy branches have been set up on the basis of specialized vehicles and isothermal vans. The mobile pharmacies are equipped with refrigerators and air conditioners to maintain the temperature regime for storing medicines.

In 2020, the Moldovan parliament adopted amendments to the law "On Pharmaceutical Activities", according to which mobile pharmacies, electronic prescriptions, a catalog of drug prices, and other innovations were to be launched in the country.

However, the initiative to introduce mobile pharmacies did not receive support from the government, which justified its position by the fact that it would be practically impossible to control the sale of medicines in such pharmacies. The deputies referred to the risks of violating the rules for storing and selling counterfeit medicines in mobile pharmacies. In March 2021, the Constitutional Court of Moldova declared the relevant amendments to the Law "On Pharmaceutical Activities" unconstitutional, and therefore mobile pharmacies did not work [4].

2.2 Mobile pharmacies as a solution to rural healthcare challenges and pharmacist shortages

Currently, both Canada and the United States are experiencing a healthcare crisis due to a shortage of pharmaceutical services in rural areas. In Canada, the government of Ontario — one of the largest provinces responsible for healthcare

provision — has implemented financial reductions affecting private and chain pharmacies. Previously, generic pharmaceutical manufacturers provided financial rebates to pharmacies as an incentive to promote the sale of generic medications over more expensive brand-name pharmaceuticals. This policy not only contributed to significant cost savings within the public healthcare system but also enabled small pharmacies, particularly those in rural regions with insufficient population density to sustain independent businesses, to remain operational [31].

Since 2009, the government has progressively reduced private rebates provided by generic pharmaceutical companies, initially cutting them by 50%. At present, there are plans to eliminate the remaining 50% of these rebates. This policy shift has led to significant opposition from the pharmaceutical sector, as small pharmacies, particularly those in rural areas, face an increased risk of closure.

As a direct consequence of these financial cuts, the revenue streams of pharmacies have been substantially reduced. For instance, if a pharmacist initially aimed for a 10% profit margin on stocked medications, a drug priced at $40 would yield a $4 profit. However, if the price of the same drug is reduced to $10, the pharmacist's profit decreases to just $1. Given that operational expenses — such as rent, salaries, and other overhead costs — remain unchanged, sustaining a pharmacy business under these conditions has become increasingly challenging.

To mitigate financial strain, many pharmacies have resorted to cost-cutting measures, including reducing employee work hours and downsizing their workforce. This trend has led to significant unemployment among pharmacy support staff, including technicians, assistants, and stock personnel, particularly in Ontario, with other provinces expected to adopt similar policies in the future [31].

Traditionally, pharmacies have operated for extended hours, typically from 9 AM to 9 PM, necessitating the employment of relief pharmacists to cover shifts when pharmacy owners are unavailable or on leave. However, under the new system, many pharmacy owners have opted to work longer hours themselves to reduce labor costs, resulting in widespread job losses for relief pharmacists.

Furthermore, these financial constraints have adversely affected the quality of pharmaceutical services, as reduced staffing levels limit the availability and efficiency of patient care. Additionally, generic drug manufacturers have been compelled to lay off a substantial portion of their workforce due to severe revenue declines [31].

Telepharmacy. In regions where no on-site pharmacist is available for direct patient counseling, some pharmacies operate through telepharmacy services. In this model, a computer technician manages physical pharmacy while a remote pharmacist provides counseling via telecommunication technologies, including computer screens, web cameras, and microphones. This setup allows pharmacists and patients to engage in real-time, face-to-face interactions for medication consultations.

Through telepharmacy, a remote pharmacist can serve both customers physically present at a pharmacy equipped with tele-counseling capabilities and individuals in other remote locations connected via the internet. However, it remains unclear whether remote pharmacists have full access to patients' medical records stored at the dispensing pharmacy, which could impact the quality and accuracy of pharmaceutical care.

Given the importance of direct pharmacist-patient interactions, there is an increasing need to ensure that rural communities have access to comprehensive, face-to-face counseling. This includes providing pharmacists with the ability to review patient records and deliver informed, personalized guidance on medication use and health management.

An emerging concept aimed at addressing this gap is the "mobile pharmacy." This term refers to a vehicle equipped with a computer and internet connectivity, staffed by at least one pharmacist and stocked with a range of healthcare products, including pharmaceuticals, vitamins, and medical supplies. Mobile pharmacies have the potential to enhance healthcare accessibility in underserved areas by combining the benefits of telepharmacy with direct pharmacist-patient interaction in a mobile setting (fig. 2.1).

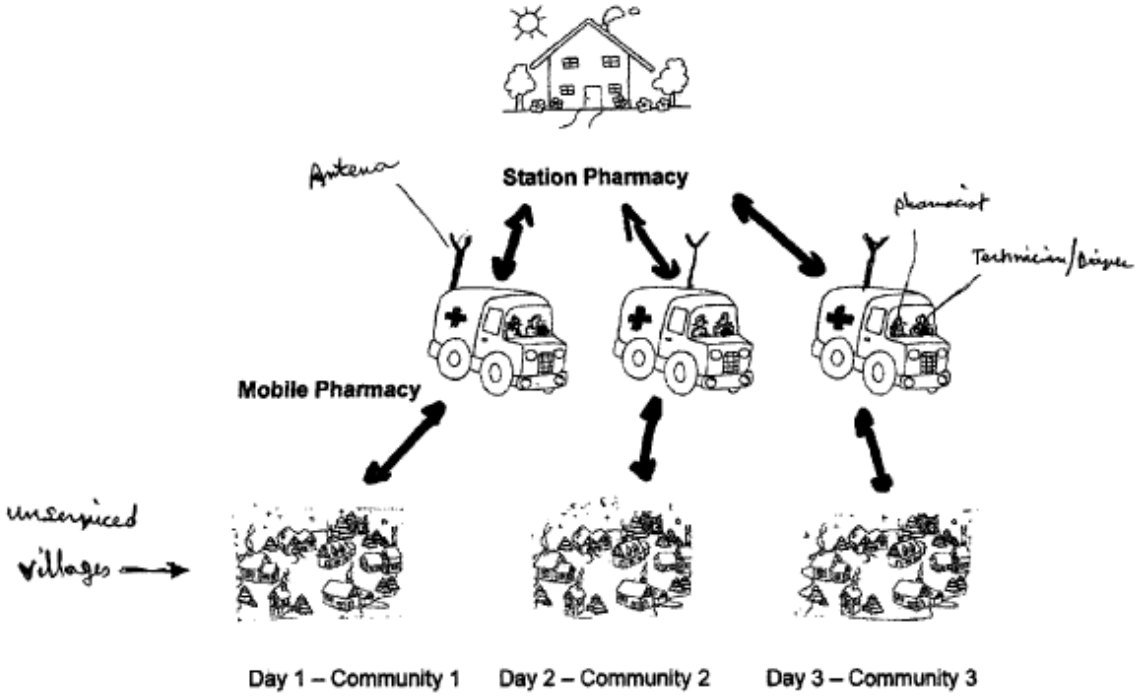

Fig. 2.1 A scheme of a mobile pharmacy route in a day-to-day operation of one embodiment of a mobile pharmacy

According to one proposed embodiment, a mobile pharmacy is designed to enhance access to pharmaceutical services in underserved areas. The mobile pharmacy consists of the following key components:

– a motorized vehicle equipped for pharmaceutical distribution;

– a sufficient inventory of healthcare products and/or medical testing devices;

– a computer system with internet connectivity to facilitate direct payment processing with government healthcare systems or third-party insurance providers [31].

The inventory of healthcare products may include medical and pharmaceutical supplies such as prescription medications, over-the-counter drugs, dietary supplements, and vitamins. Additionally, the mobile pharmacy is equipped with diagnostic devices, including but not limited to blood pressure monitors, blood glucose testing devices, and cholesterol level testing instruments. These tools enable preliminary health screenings and assist in identifying emergency

cases. The mobile pharmacy can replenish its stock at a designated stationary pharmacy.

Another embodiment involves utilizing the mobile pharmacy to provide face-to-face pharmacist counseling to diverse communities. This approach ensures that patients, particularly those in rural and underserved regions, receive professional pharmaceutical guidance tailored to their individual health needs.

The mobile pharmacy model presents a potential solution to the rising unemployment crisis in the pharmaceutical industry. By creating job opportunities for unemployed pharmacists and pharmacy technicians, mobile pharmacies offer an alternative to traditional, stationary pharmacy positions. Moreover, stationary pharmacies that establish partnerships with mobile units could experience an increase in sales, leading to potential business expansion and additional employment opportunities [31].

Another proposed embodiment seeks to restore the professional role of pharmacists in patient care by expanding pharmaceutical services through mobile pharmacy networks. By generating additional revenue streams, pharmacies can reinvest in high-quality pharmaceutical services, thereby enhancing patient care and medication management.

The implementation of mobile pharmacies is also expected to boost the sales of generic pharmaceutical companies, leading to expanded business operations and increased employment opportunities within the generic drug sector [31].

Finally, mobile pharmacies offer a scalable solution for extending healthcare services to a broader segment of the Canadian population, particularly those residing in remote or underserved areas where traditional healthcare facilities are not readily available. This model aligns with the objective of improving healthcare equity and accessibility.

In various embodiments, mobile pharmacies are designed as medium-sized motorized vehicles equipped with a comprehensive inventory of commonly used medications and a computer system with internet connectivity. This connectivity is

established via Wi-Fi, an antenna, or mobile phones, ensuring seamless communication and operational efficiency.

Each mobile pharmacy is an extension of a stationary pharmacy, which serves as its primary supply center. The station pharmacy functions as a central hub that stocks a wide range of pharmaceuticals, vitamins, and medical supplies, from which the mobile unit regularly resupplies [31].

The mobile pharmacy is typically staffed by:

– a pharmacy technician/driver (permanent hire), responsible for vehicle operation and assisting with inventory management.

– a pharmacist (either permanent or relief hire), responsible for medication dispensing and patient counseling.

To ensure continuity in pharmaceutical care and foster trust within the community, it is preferable that either the pharmacist or the technician/driver remains consistent in day-to-day operations. This stability facilitates the development of strong pharmacist-patient relationships, enhancing long-term customer engagement and adherence to medication regimens.

Each mobile pharmacy can serve multiple villages per week, significantly expanding access to pharmaceutical services in rural and underserved areas.

The mobile pharmacy periodically returns to its station pharmacy to restock pharmaceuticals and medical supplies. This resupply process occurs daily or every few days, depending on demand and inventory levels. Additionally, the mobile unit has the capability to place medication orders online for specific drugs that are not typically included in its standard inventory. This feature ensures that patients receive necessary medications in a timely manner, even if they are not part of the pharmacy's regular stock [31].

By functioning as a flexible and community-oriented extension of a stationary pharmacy, mobile pharmacies offer a practical and scalable solution for improving healthcare accessibility, particularly in remote regions where traditional pharmacies are not available.

Mobile pharmacies offer a viable solution to two critical issues in pharmaceutical healthcare:

1. Restoring pharmaceutical services in underserved areas – a single mobile pharmacy can compensate for the loss of multiple closed pharmacies by serving several villages, ensuring continued access to essential medications and professional consultation.

2. Mitigating pharmacist shortages in specific regions — in areas facing a shortage of pharmacists, a single mobile pharmacy enables one pharmacist to serve multiple villages. This approach ensures face-to-face patient counseling, thorough patient profile reviews, and the prevention of contraindications, allergic reactions, and drug interactions — critical safety measures that cannot be replicated by automated dispensing systems [31].

Large chain pharmacies can leverage mobile pharmacy services to enhance their pharmaceutical outreach, contributing to community health and well-being. Additionally, mobile pharmacies create new employment opportunities within the pharmacy industry, addressing job losses among pharmacists, pharmacy technicians, and professionals in the generic pharmaceutical manufacturing sector.

Mobile pharmacies function as extensions of their designated station pharmacies, serving as a bridge between centralized pharmaceutical services and rural communities. The standard operational workflow includes:

- Scheduled community visits — the mobile pharmacy follows a rotational schedule, visiting different communities (e.g., Community 1, 2, and 3) on consecutive days. Depending on demand, multiple communities may be served within a single day.
- Pharmacist attendance — a licensed pharmacist is required to be present during operations to ensure proper medication dispensing, provide patient counseling, and address pharmaceutical concerns.
- Support staff — the team may also include a technician/driver, responsible for:

- assisting with administrative tasks such as answering phone calls and managing patient data entry;
- preparing medications for dispensing;
- acting as a liaison in cases where pharmacists rotate.

- Medication supply and replenishment — the pharmacist has the ability to place medication orders from the station pharmacy, ensuring that any required medications not carried in the mobile pharmacy's standard inventory are procured. Orders are typically fulfilled upon the mobile pharmacy's return to its station at the end of the day [31].

By integrating mobile pharmacies into the healthcare system, pharmaceutical access, employment opportunities, and medication safety standards can be significantly improved in underserved regions.

2.3 Overview of additional services of mobile pharmacies in different countries

In Japan, mobile pharmacies have been used in prefectures, particularly in Miyagi, following the 2011 Great East Japan Earthquake and subsequent tsunami. In 2019, a new mobile pharmacy truck was unveiled in the Tokyo suburb of Hachioji, transporting medicines and pharmacists to disaster-stricken areas. The truck is the 15th mobile pharmacy truck in Japan [22].

The specially converted van is equipped with solar panels on the roof, allowing it to operate in areas without water or electricity. During disasters, the mobile pharmacy will transport pharmacists and 200 to 300 types of medicines to affected areas. The project is implemented with the participation of the Hachioji City Government, the Hachioji Pharmaceutical Association and the Tokyo University of Pharmacy and Life Sciences. In normal times, the van is used to train pharmacists and conduct disaster drills on the university's campus in Hachioji [22].

Springer conceptualized a mobile healthcare system designed to deliver primary care, infectious disease management, treatment for substance use

disorders, essential clinical services, and, critically, medications directly to individuals in their communities. In 2022, Springer was honored with the Avant-Garde Award by the National Institute on Drug Abuse, which has provided funding for this groundbreaking initiative [13].

In the US, retail pharmacies are currently allowed as mobile pharmacies in the state of Connecticut, the first state in the USA to legalize mobile retail pharmacy services. The first legal mobile pharmacy, a project conceived by a Yale School of Medicine professor, was legalized in July 2023 and became a reality in September 2023 [14].

The InMOTION project trains people to work as community health coordinators in communities affected by drug overdoses. The objective of InMOTION is to enhance healthcare accessibility for individuals who are disconnected from the healthcare system, regardless of the underlying reasons. They are trained to conduct testing for HIV, hepatitis C, and opioid addiction. The coordinators also identify individuals who are HIV-negative and can receive pre-exposure prophylaxis to prevent or treat HIV [14].

Community health coordinators are people who live in or have connections to their communities. They help address socio-economic needs such as housing, food, clothing, and employment. They also use telemedicine services to act as a bridge between the patient and the health care provider [14].

In 2024, Yale Medicine and Yale New Haven Health System launched Connecticut's first mobile retail pharmacy and clinic, bringing healthcare directly to individuals in their communities. InMOTION operates as a mobile pharmacy clinic program, offering both pharmaceutical and clinical services through the state's first legalized mobile retail pharmacy. The InMOTION team, consisting of a pharmacist and clinicians, collaborates to ensure access to pharmacy services, healthcare, and connections to social support resources for community members wherever they are. The mobile pharmacy and clinic also provide a private and confidential environment for addressing healthcare needs [29].

The InMOTION mobile pharmacy delivers medications, vaccinations, clinical care, and disease management services directly to individuals in need. It is particularly beneficial for those who face challenges in attending medical appointments or obtaining medications due to transportation barriers, caregiving responsibilities for young children or family members with disabilities, or being unhoused and requiring healthcare services in their current location [13, 29].

Fig. 2.2 The mobile pharmacy clinic program InMOTION

The InMOTION mobile pharmacy provides primary care services, including screening and treatment for common conditions such as hypertension and diabetes. Additionally, it offers testing and treatment for HIV, hepatitis C, and sexually transmitted infections, as well as HIV prevention through pre-exposure prophylaxis (PrEP). The program also delivers mental health care, wound care, and comprehensive services for diagnosing and treating substance use disorders, including alcohol and opioid use disorders, among other healthcare needs [13, 29].

The “InMOTION” mobile pharmacy service include:

- filling prescription medications;
- administering vaccinations;
- clinical care through in-person visits and via telehealth;

- blood draw (phlebotomy) services;
- care for chronic conditions (like diabetes and high blood pressure);
- primary care health services;
- specialty services for wound care;
- specialty services for infectious diseases;
- mental healthcare;
- addiction services, including emergency naloxone treatment for substance use disorder;
- social service assistance for financial navigation and housing applications [18, 29].

Modern Korean society is faced with the problem of low birth rate and aging population, which is associated with the emergence of disability, especially in rural areas, where many elderly people and people with disabilities live. These categories of the population face difficulties in using pharmacy or medical services in stationary institutions, as they have difficulty moving. Against the background of the problem of transporting patients, which leads to the expenditure of money and time, the feasibility of implementing mobile pharmacies using vehicles to increase the availability of medicines is being considered. With the help of mobile pharmacies, a pharmacist and a social worker can travel together to places where vulnerable groups of the population are, ensure their access to medicines, and determine whether they are entitled to social security, which will have a positive impact on medical care [16].

In 2018, Walmart, which has more than 4,600 pharmacies in the United States, launched a mobile pharmacy called Big Blue to serve people in areas affected by natural disasters or wildfires. Since its launch, Big Blue has been used nine times. The mobile pharmacy can be set up on site in about 30 minutes. The sides of the trailer expand, creating space for two pharmacists and several technicians. The pharmacy is equipped with a waiting room, a consultation room and bathrooms [24].

The Big Blue mobile pharmacy is equipped with about $300,000 worth of medications, including refrigerators for insulin and other medications that require cold storage. The pharmacy can fill up to 300 prescriptions per day. It also supplies COVID-19, flu, tetanus vaccines, as well as high blood pressure medications and insulin as needed. The pharmacy can serve both Walmart customers and other community residents with a prescription [24].

The Big Blue mobile pharmacy is equipped with about $300,000 worth of medications, including refrigerators for insulin and other medications that require cold storage. The pharmacy can fill up to 300 prescriptions per day. It also supplies COVID-19, flu, tetanus vaccines, as well as high blood pressure medications and insulin as needed. The pharmacy can serve both Walmart customers and other community residents with a prescription [23].

In 2024, California passed a bill that would allow mobile pharmacies to supply and dispense opioid addiction medications, such as buprenorphine, starting January 1, 2025. Patients would also be able to sign up for treatment and rehabilitation services to combat drug addiction. Experts estimate that expanding the capabilities of mobile pharmacies will help hundreds of thousands of Californians suffering from opioid use disorders overcome withdrawal symptoms and prevent risky behaviors that put people at risk [30].

Individuals living in rural communities often face significant geographic barriers to accessing comprehensive cancer care, including participation in clinical trials at major cancer centers. This distance can contribute to disparities in treatment and outcomes. Bringing cancer care directly to patients within or near their rural communities helps mitigate these barriers and enhances access to essential oncology services [19].

In the US state of Illinois, mobile pharmacies have been used to improve access to medical and pharmaceutical care for cancer patients. People living in rural areas far from major cancer centers are vulnerable to inequitable access to health care. If these barriers are not addressed, it can lead to patients not seeking cancer treatment or, more importantly, not participating in clinical trials. One way

to address this inequity is to create central hubs that pool staff and resources to serve rural communities. A new development in this model has recently emerged: a USP 80-compliant mobile pharmacy vehicle, the so-called “mobile pharmacy.”

Fig. 2.3 Cancer Care mobile pharmacy of Illinois

Cancer Care Specialists of Illinois, a founding member of Heartland Cancer Research, has designed, developed, and launched a pioneering mobile pharmacy, the first of its kind. The vehicle is based in a rural hub, where it is restocked daily and serviced by a ground crew in preparation for daily trips to remote clinics [15].

Arriving at a rural clinic, the pharmacy allows the oncologist to see patients and administer anticancer drugs directly at the patient’s place of residence. MAPs allow for the provision of complex pharmaceutical services without the need to create infrastructure in communities where it is only needed once a week. This also reduces the cost of expensive drugs and their disposal if they are not used. With mobile pharmacies, drugs are delivered in an unmixed state, and their mixing occurs only after the patient’s condition is assessed. Mobile pharmacies guarantee the same level of pharmaceutical care as in major cancer centers, which meets standards. The ordering, verification, labeling and billing processes are performed in the EPIC system, which ensures the correctness of treatment and payments [15].

Additionally, mobile pharmacies increase patient access to therapeutic clinical trials. This allows compliance with FDA and other regulatory requirements while improving access to cancer research. The mobile program bridges the gap between treatment outcomes for cancer patients in urban and rural areas [15].

Conclusions to the part 2

1. International experience demonstrates the effectiveness of adapted solutions to improve access to medicines in remote regions. For example, in Germany and Romania, local prescription collection points and retail outlets have been introduced, and in Estonia, Kazakhstan and Uzbekistan, mobile pharmacies are operating. These practices show how national characteristics influence the formation of models of drug provision.

2. In some countries, such as Moldova, mobile pharmacy initiatives have faced challenges due to lack of effective controls, risks of drug counterfeiting, and logistical difficulties. This highlights the need for detailed planning, clear regulations, and a robust monitoring system to ensure the safe and effective operation of mobile pharmacies.

3. Mobile pharmacies serve as an innovative and practical solution to the healthcare crisis in rural regions of Canada and the United States. By extending pharmaceutical services to multiple villages, they ensure continued access to essential medications, professional pharmacist counseling, and preliminary health screenings, addressing the challenges posed by the closure of traditional pharmacies and pharmacist shortages.

4. The implementation of mobile pharmacies not only helps sustain small pharmacies and generic pharmaceutical manufacturers but also creates new employment opportunities for pharmacists, pharmacy technicians, and support staff. Additionally, large pharmacy chains can leverage mobile pharmacies to expand their reach while maintaining high-quality pharmaceutical services,

ultimately contributing to improved public health and economic stability in rural communities.

5. Mobile pharmacies, as in the US, Japan and Estonia, have proven effective during natural disasters, military operations and difficult logistics. Their advantages include rapid response, the ability to deliver medicines even to the most remote settlements and the flexibility to change routes depending on needs. They also contribute to the even distribution of medicines among vulnerable groups of the population.

6. In many countries, mobile pharmacies perform not only the function of delivering medicines, but also provide comprehensive medical services. In the USA, these include vaccinations, treatment of chronic diseases, prevention of opioid addiction, and in Japan, support for victims of natural disasters. This allows mobile pharmacies to integrate into the health care system, reducing the burden on stationary institutions.

PART 3

DIRECTIONS FOR IMPROVING THE WORK OF MOBILE PHARMACIES IN UKRAINE

3.1 Analysis of licensing requirements for the operation of mobile pharmacies in Ukraine

The Resolution of the Cabinet of Ministers of Ukraine dated August 4, 2023 No. 809 approved amendments to the Licensing Conditions for conducting economic activities in the production of medicinal products, wholesale and retail trade of medicinal products, import of medicinal products (except for active pharmaceutical ingredients) [7].

This document introduces a new term for the first time — "mobile pharmacy point". A mobile pharmacy point is a vehicle used by a licensee that carries out business activities in the retail trade of medicines in order to provide the population with medicines through their sale, information about which is entered in the license register [7].

A separate section entitled “Requirements for the organization and implementation of retail trade in medicines through mobile pharmacy points” has been created in the Licensing Conditions.

According to the requirements of the Licensing Conditions, licensees engaged in economic activity in the retail trade of medicines have the right to trade medicines through MAP exclusively:

- in rural areas in the absence of a stationary pharmacy or pharmacy point in the settlement;

- in territories where a state of emergency has been introduced, for the period of the state of emergency;

- in territories where active hostilities are being conducted, which are included in the List of territories where hostilities are (were) conducted or temporarily occupied by the Russian Federation, approved by the Ministry of Reintegration, for the period of martial law and 12 months after its termination or cancellation [7].

The sale of medicines through mobile pharmacy is permitted only in the absence of a pharmacy or pharmacy point in a settlement located in a rural area. Mobile pharmacies s carry out retail trade in medicines that are dispensed by prescription and without a doctor's prescription.

A licensee who carries out economic activities in the retail trade of medicines through mobile pharmacies must staff them with one driver and at least one pharmaceutical employee who will directly carry out the retail trade of medicines. The requirement for the presence of a manager in the staff of a pharmacy point, established in clause 184 of the Licensing Conditions, does not apply to mobile pharmacies [7].

The licensee must ensure that the mobile pharmacy complies with the following requirements:

- the vehicle must have sufficient space for proper storage and sale of medicines, medical devices and other goods permitted for sale by order of the Ministry of Health, placement of a cash register and refrigeration equipment;

- compliance with general and specific storage conditions for medicines specified by the manufacturer, including the availability of refrigeration equipment;

- availability of devices for recording and monitoring temperature and relative humidity;

- ensuring the serviceability of all measuring equipment and conducting their periodic verification or calibration;

- placement in an accessible place of information about:

- availability of a license;

- features of the rules for dispensing medicines;

- location and telephone number of the licensee engaged in retail trade of medicines through the mobile pharmacy;

- location and telephone number of the body ensuring the protection of consumer rights:

- location and telephone number of the territorial body of state quality control of medicines;

- approved route of the motor vehicle in which the mobile pharmacy is located;

- the vehicle must have on its external surfaces the inscription "mobile pharmacy" and information about belonging to a specific licensee;

- the presence of a place for dispensing drugs;

- the presence of an opportunity for hand sanitization [7].

For the implementation of economic activity in the retail trade of medicinal products through mobile pharmacies, motor vehicles are allowed to be used, which:

- are the property of the licensee or provided to the licensee for use;

- information about which is entered in the license register as motor vehicles used by the licensee to carry out economic activity in the retail trade of medicinal products through mobile pharmacy;

- are registered in accordance with the "Procedure for state registration (re-registration), deregistration of automobiles, buses, as well as self-propelled vehicles constructed on the chassis of automobiles, motorcycles of all types, makes and models, trailers, semi-trailers, motorized carts, other vehicles equated to them and mopeds", approved by the resolution of the Cabinet of Ministers of Ukraine dated September 7, 1998 No. 1388;

- have passed mandatory technical inspection and for which a protocol of inspection of the technical condition of the vehicle has been drawn up in accordance with the "Procedure for conducting mandatory technical inspection and the scope of inspection of the technical condition of vehicles", approved by the Resolution of the Cabinet of Ministers of Ukraine dated January 30, 2012 No. 137, and whose technical condition meets the requirements of operational safety.

It is prohibited to use the same mobile pharmacy by two or more licensees simultaneously for the purpose of conducting business activities in the retail trade of medicinal products.

The route of the mobile pharmacy for carrying out economic activities in the retail trade of medicinal products is approved by the licensee. The licensee is obliged to submit to the State Service for Medicinal Products and the local self-government body a notification about the mobile pharmacy route before the start of the activity. The route must contain information about the point of departure and the final destination, including loading/unloading points and the parking place of the vehicle. When changing the route, the licensee is obliged to inform the territorial body of the State Service for Medicinal Products and local self-government bodies before the start of the activity. In the event of the closure of the route, the licensee is obliged to inform the territorial body of the State Service for Medicinal Products and local self-government bodies no later than within three working days [7].

To obtain a license to operate a mobile pharmacy, the licensee fills out the "Information on the availability of material and technical resources and qualified personnel necessary for conducting business activities in the retail trade of medicines."

This document contains the following information for obtaining a license:

- registration number of the mobile pharmacy for retail trade in medicines;
- legal basis for using the mobile pharmacy (the mobile pharmacy is used on the right of ownership or use);
- document confirming the right of ownership or use of the mobile pharmacy (with the date and number);
- characteristics of the mobile pharmacy (model and type of the mobile pharmacy; year of manufacture);
- availability of devices for recording and monitoring temperature and relative humidity;
- availability of a first aid kit (medicines and other means, the list of which is approved by the licensee) for providing pre-hospital medical care;
- availability of a place for hand hygiene [7].

Mobile pharmacies have become an effective tool for improving access to medicines in remote regions and regions affected by Russian armed aggression. Thanks to the efficiency and accessibility of mobile pharmacies, residents of communities can easily access pharmaceutical care.

3.2 Features of the organization of mobile pharmacy in Ukraine

Since the beginning of the full-scale Russian invasion of Ukraine, the situation with medicines has been difficult. In the first weeks, panic and closed pharmacies, as well as deteriorating logistics, led to a shortage of many necessary medicines. Patients who found themselves in occupation or in front-line settlements lost the opportunity to receive medicines on prescription, and it was too difficult to buy them. All hope was placed on volunteers who undertook to deliver the most necessary medicines — antihypertensive, antiallergic, antidiabetic and others.

The Resolution of the Cabinet of Ministers of Ukraine of August 4, 2023 provided an opportunity to launch the “Mobile Pharmacy” project. Changes in legislation allowed pharmacy chains to organize mobile pharmacies to ensure the population's access to vital medicines. The first mobile pharmacy in Ukraine was launched by the Pharmacy 9-1-1 network. Thanks to the work of MAPs, uninterrupted access to medicines and medical devices is ensured for patients with chronic diseases, which is especially important for socially vulnerable segments of the population [7].

As soon as local communities in the Kharkiv region learned about the launch of the first mobile pharmacy, requests began to come in asking to come to them. But according to the rules, the mobile pharmacy can provide its services only where no other pharmacies are registered. In the Kharkiv region, during the full-scale invasion, many pharmacies, including private ones, closed down, but officially continued to exist.

Representatives of the 9-1-1 pharmacy network contacted the owners of registered pharmacies and found out their willingness to resume the work of their pharmacy establishments. If the pharmacy did not plan to reopen, the owner was asked to cancel the license. Some agreed, for example, the owner of a pharmacy in Prudyanka. Thanks to this, it was the residents of Prudyanka who were the first to meet the mobile Pharmacy 9-1-1, which was opened on January 18 by the Minister of Health Viktor Lyashko. Also on that day, the pharmacy visited the villages of Dubivka, Tokarivka and Bezruky, where people had long suffered without medicines. In January alone, 405 patients with chronic diseases, who previously had to travel dozens of kilometers to the nearest pharmacy, received medications prescribed by a doctor at the mobile pharmacy, including insulin and test strips for blood sugar control [20].

The organization of the work of mobile pharmacy included the following stages:

- equipping the vehicle;
- searching and selecting qualified personnel;
- training personnel in the specifics of work in the mobile pharmacy;
- cooperation with the military administration;
- cooperation with the Department of Health of the Kharkiv Regional State Administration, the Ministry of Health and the State Medical Service to form optimal MAP routes;
- forming the product range of the mobile pharmacy;
- forming a pricing policy [20].

The mobile pharmacies of the “Pharmacy 9-1-1” chain are equipped with a generator and Starlink, which allows serving patients on electronic prescriptions, including under the state program “Affordable Medicines”, in the absence of mobile communication and the Internet.

Staff training, in addition to the specifics of pharmaceutical care for elderly patients with chronic diseases, should include the ability to use a generator and Starlink, bulletproof vests, and electronic warfare equipment. The generator and

Starlink provide uninterrupted communication, thanks to which the electronic prescription is processed without problems even when there is no electricity.

To inform the population about the arrival of the mobile pharmacy, the pharmacy chain cooperates with local administrations and family doctors, who distribute announcements about the arrival of the mobile pharmacy on a certain date. An interesting approach was used by the “Pharmacy 9-1-1” chain to determine the route of the first mobile pharmacy, based on information on the number of prescriptions that were written for drugs under the “Affordable Medicines” program, but were not processed in pharmacies. In this way, it was possible to find out where exactly, due to the lack of pharmacies, the greatest unfulfilled demand for this service arose. Currently, “Pharmacy 9-1-1” has two mobile pharmacies in the Kharkiv region and one in the Kherson region [21, 27].

In April 2023, the second mobile pharmacy of the “Pharmacy 9-1-1” chain appeared in the Kharkiv region. Both work in the Kharkiv region, serving residents of more than 110 settlements — villages where there are no stationary pharmacies. As of June 10, 2024, 1,498 prescriptions were processed by pharmacists of the “Pharmacy 9-1-1” pharmacy chain in the mobile pharmacy as part of the state program “Affordable Medicines”. In another dangerous region — in the Kherson region, residents of more than 50 settlements of the Beryslav district were until recently forced to travel dozens of kilometers for medicine. But on August 16, 2024, social justice in the Kherson region, the third mobile pharmacy of the “Pharmacy 9-1-1” chain appeared.

When organizing the provision of medicine to the population in rural areas and frontline areas, it is important to take into account the peculiarities of the assortment and pricing policy. When forming the assortment, it was important to ensure the availability of drugs under the state program "Affordable Medicines": for the treatment of cardiovascular diseases, antihypertensives, for the prevention of strokes and heart attacks; drugs for non-diabetic and diabetes mellitus; for the treatment of chronic diseases of the lower respiratory tract; mental disorders, behavior, epilepsy, etc.; insulins and medical devices [9].

By order No. 1537 of September 4, 2024, the Ministry of Health approved updated lists of medicines and medical devices that are subject to reimbursement under the "Affordable Medicines" program. In total, the updated lists include: 472 drugs; 63 insulin preparations; 9 combined drugs; 45 medical devices (test strips for measuring blood glucose levels). In addition, mobile pharmacies have a wide selection of other pharmacy products.

The product range of mobile pharmacies should include vital drugs for patients with chronic diseases. For example, for patients with diabetes, it is important to deliver insulin at the request of patients or medical professionals. In addition, the assortment of the mobile pharmacy should include oral hypoglycemic drugs, test strips, lancets, glucometers and other related goods. The mobile pharmacy should promptly respond to the needs of the local community, delivering walkers, crutches, etc. if necessary. A feature of the assortment management is a thorough analysis of the remaining stock and daily replenishment of stocks before each trip [20].

Given the specifics of the consumer contingent, it is important to ensure the availability of drugs dispensed under the “Affordable Medicines” program. From the perspective of socially responsible marketing, prices for drugs, medical devices, and other pharmacy products in mobile pharmacies should not exceed prices in stationary pharmacies of the network. An analysis of publications showed that important issues in organizing the work of mobile pharmacies are compliance with licensing conditions, ensuring proper temperature storage of drugs, a sufficient range of drugs, medical devices, and baby food, and proper pharmaceutical care.

In early 2024, the Cherkasy Regional KP "Pharmacy" launched the mobile pharmacy project. The first trip was made in February, and in March the second mobile pharmacy in the Uman direction began its work. 42 routes have been developed and approved, serving residents of more than 200 villages and settlements where there are no stationary pharmacies.

The big challenge of implementing mobile pharmacies for the state is that it does not bring any financial benefits to the licensee, the mobile pharmacy operator. This project is perceived exclusively as a social initiative of the pharmacy business, which, given the specifics of its activities, is one of the most socially oriented.

Technical support to Ukrainian pharmacy operators in implementing social initiatives can be provided by international organizations. For example, the project "Innovations to Overcome the HIV Epidemic", implemented by the United States Agency for International Development (USAID), joined in supporting the implementation of mobile pharmacies and openly selected "Ukrvaktsyna" as a partner. Mobile pharmacy was implemented in the Kyiv region through joint efforts.

In the remote villages of Kyiv region, on May 14, 2024, the first mobile pharmacy of the State Enterprise "Ukrvaktsyna" of the Ministry of Health of Ukraine began operating. First of all, the pilot project covered the most remote villages where there are no stationary pharmacies and residents do not have access to the necessary medicines.

Mobile pharmacy routes have been developed for another community of the Kyiv region and for six more communities of the Zhytomyr and Chernihiv regions. In total, within the framework of the pilot project, "Ukrvaktsyna" plans to cover more than 130 villages and towns in eight communities of the three regions.

It is planned that the mobile pharmacies of the State Enterprise "Ukrvaktsyna" of the Ministry of Health of Ukraine" will work in eight territorial communities of three regions — Kyiv (39 settlements), Zhytomyr (53 settlements) and Chernihiv (39 settlements).

In less than 1 month of operation, the mobile pharmacies in the Kyiv region visited 34 villages and settlements, more than 350 rural residents used the services of the mobile pharmacies, more than 280 names of medicines were dispensed and 17 prescriptions were paid under the "Affordable Medicines" program.

Information about the work of the mobile pharmacies and planned routes is provided in the relevant channels of the "Mobile Pharmacy "TUT" social networks, in local media and pages on social networks of communities, as well as from the family doctor and local authorities, with whose heads the routes have been agreed.

On September 27, 2024, the first mobile pharmacy went on the route in Zaporizhia region. The mobile pharmacy route covers six villages in the direction of Novomykolaivka: the settlements of Vasylkivske, Maksymivka, Krutyi Yar, Novoivankivka, Dudnikove and Storchove. And on November 28, a second mobile pharmacy opened in Zaporizhia region, which will run every Wednesday and cover the villages of Nyzhnia Khortytsia, Rozumivka, Maryivka and Kanivske. On December 22, a third mobile pharmacy started operating in Zaporizhia region. It will deliver medicines to at least 30 villages in the Shyrokivska community where there are no stationary pharmacies.

Currently, mobile pharmacies in Ukraine have been launched in Kharkiv, Kherson, Mykolaiv, Cherkasy, Chernihiv, Kyiv, Ternopil, Rivne, Odessa, Zhytomyr, Zaporizhia and other regions [12, 21].

3.3 Directions for improving the work of mobile pharmacies in Ukraine

Important components of ensuring the quality of pharmaceutical services provided by mobile pharmacies are:

- providing mobile pharmacies with modern equipment to support proper drug storage conditions, in particular generators and communication systems (e.g. Starlink);

- careful route planning based on the needs of local communities (e.g. analysis of undistributed prescriptions under the "Affordable Medicines" program);

- cooperation with local administrations, medical institutions and authorities for prompt service;

- providing a range of vital drugs for patients with chronic diseases, such as insulin, glucose-lowering drugs, test strips, etc.;

- selling drugs at affordable prices that do not exceed prices in stationary pharmacies;

- rapid adaptation of the range to the needs of local communities (e.g. provision of medical products, baby food, crutches, walkers, etc.);

- training staff on the specifics of serving the elderly and working in conditions of limited access to communications or other resources;

- developing pharmaceutical care skills, including detailed explanations of the use of medications for patients with perception difficulties;

- integration with other medical programs, such as vaccination or basic diagnostics;

- providing electronic prescriptions and cashless payments, which will increase the convenience of service;

- regularly informing the population about the schedule and routes of the mobile pharmacy through local administrations, doctors, social networks and other channels;

- conducting educational work on accessible programs and rules for obtaining medications.

Based on the analysis of literary sources, we have proposed the following areas for improving the quality of the work of the mobile pharmacy:

1. Standardization and certification:

- development of standards for mobile pharmacies, including requirements for equipment, storage of drugs and compliance with sanitary and hygienic standards;

2. Expanding access to medical services:

- integration with telemedicine — providing the opportunity to receive a doctor's consultation via video call directly at the mobile point;

- focus on rural and remote areas — ensuring the availability of medicines and consultations for communities where there are no stationary pharmacies.

3. Digitalization of processes:

- implementation of electronic prescriptions and inventory management systems to avoid shortages or excesses of drugs;

- installation of POS terminals for convenient payment.

4. Improving the skills of personnel:

- conducting regular training for pharmacists on communication with clients, awareness of modern drugs and rules for their storage;

- training in first aid to enable prompt response to emergencies.

5. Strengthening quality control:

- implementation of an audit system to check the conditions of storage, transportation and provision of medicines;

- regular monitoring of consumer feedback through questionnaires or mobile applications.

6. Improving the material and technical base:

- use of modern equipment to maintain the temperature regime (refrigerators, thermal containers);

- equipping medical facilities with generators and autonomous power supply systems.

7. Information campaign:

- informing the population about the availability and schedule of medical facilities through social networks, local media or mobile applications;

- conducting educational events for the population on the correct use of medicines;

8. Partnership with local communities:

- cooperation with local authorities and medical institutions to better understand the needs of the territorial community;

- organization of mobile medical teams in partnership with pharmacies for comprehensive patient care.

Expanding the list of services that can be provided through mobile pharmacies can significantly increase their effectiveness and benefit to the population.

We offer the following additional services:

1. Basic medical care:

- measuring blood pressure, blood sugar, pulse and saturation;

- conducting tests for infectious diseases (for example, rapid tests for COVID-19, HIV or hepatitis);

- providing consultations on the use of medical devices (glucometers, tonometers, etc.).

2. Diagnostics and monitoring:

- primary diagnostics (blood or urine analysis using portable devices);

- monitoring the condition of patients with chronic diseases (diabetes, hypertension, cardiovascular diseases).

3. Vaccination:

- conducting vaccinations (for example, against influenza, COVID-19 or other infectious diseases) in compliance with the necessary sanitary conditions.

4. Psychological care:

- consulting a psychologist or providing contacts for psychological support services;

- conducting information events on overcoming stress and depression.

5. Pharmacist support:

- consultations on the correct use of drugs, drug interactions and possible side effects;

- assistance in issuing electronic prescriptions and connecting to state support programs ("Affordable Medicines").

6. Educational activities:

- conducting seminars and trainings on first aid;

- informing about the prevention of chronic diseases, a healthy lifestyle.

7. Medical consultation via telemedicine:

- providing consultations with doctors of various specialties via video communication;

- remote monitoring of patients' condition by doctors using telemedicine platforms.

8. Provision of medical equipment:

- rental or sale of portable medical devices (inhalers, pulse oximeters, glucometers);

- supply of additional means for patient care (crutches, walkers, orthopedic products).

9. Social support:

- assistance in processing documents for obtaining social or medical assistance;

- cooperation with volunteer and charitable organizations to help vulnerable segments of the population.

10. Support for young mothers:

- sales of baby food, diapers and other necessary goods;

- consultations on infant care and breastfeeding.

The implementation of these services requires coordination with regulatory documents and appropriate staff training. At the same time, it will significantly improve the quality of medical and pharmaceutical care in remote regions.

3.4 Analysis of the economic component and SWOT-analysis of the implementation of mobile pharmacies

The implementation of mobile pharmacies requires significant initial investments and regular costs for their operation. Below are the main cost items and approximate calculations based on foreign experience:

1. Purchase and re-equipment of transport:

1.1. Transport: Specialized cars or vans equipped for pharmacy work (departments for pharmacists, patients, place for storing medicines). Cost: 20,000–50,000 USD.

1.2. Equipment: Medicine cabinets, refrigerators (for temperature-controlled medicines), air conditioners, safes for storing narcotic drugs, solar panels (if necessary). Cost: 10,000–20,000 USD.

Total: 30,000–70,000 USD at the initial stage.

2. Staff salaries:

1.1 Pharmacist (from 800 to 1,200 USD per month depending on the region).

1.2 Driver (500–800 USD per month).

1.3 Possible additional employees: consultants, nurses.

Monthly salary costs: 1,300–2,000 USD.

3. Logistics and operating costs:

3.1 Fuel: 300–600 USD per month.

3.2 Vehicle maintenance: 1,000–2,000 USD per year.

3.3 Insurance: 500–1,000 USD per year.

4. Procurement of drug supplies and consumables:

4.1 Creation of an initial drug stock. Cost: 5,000–10,000 USD for an average mobile pharmacy.

5. Regulatory costs:

5.1 Licenses, permits, connection to electronic health systems (e.g., for working with e-prescriptions). Cost: 1,000–3,000 USD.

Approximate total costs for starting a mobile pharmacy:

- initial investment: 40,000–85,000 USD;
- monthly expenses: 2,000–3,500 USD.

The payback of mobile pharmacies depends on the number of patients served and the financing structure. In many countries, pharmacies receive state subsidies or preferential lending, which allows them to reduce the burden on their own resources.

Based on the analysis of literary sources and the generalization of our own research, we have identified the strengths and weaknesses, as well as threats and opportunities for the implementation of mobile pharmacies in Ukraine (table 3.1).

Table 3.1

SWOT-analysis of the implementation of mobile pharmacies in Ukraine

S (Strengths)	**W (Weaknesses)**
1. Availability of medicines in remote areas. Mobile pharmacies provide access to medicines in rural areas where there are no stationary pharmacies. 2. Speed of service. Mobile pharmacies can quickly deliver medicines to regions with limited access to medical services, for example, during emergencies. 3. Flexibility in location. The ease of moving mobile pharmacies allows them to adapt to the needs of the population depending on the time, season or events. 4. Reduction in infrastructure costs. The absence of the need to build or rent premises reduces initial start-up costs.	1. Limited range of medicines. Due to space constraints, mobile pharmacies have a smaller selection of medicines compared to stationary points. 2. Dependence on transport costs. Rising prices for fuel and transport services reduce profitability. 3. Logistics risks. Difficulties with delivery to hard-to-reach places due to poor roads, weather conditions or military operations. 4. Legal and regulatory restrictions. It is necessary to ensure compliance with regulations on the storage, transportation and sale of medicines, which complicates implementation.
O (Opportunities)	**T (Threats)**
1. Improving healthcare. Increasing access to medicines and medical consultations in low-income regions. 2. Collaboration with local authorities and charities. Attracting grants or government funding to support the initiative. 3. Integration with online platforms. The ability to order medicines online and receive them through mobile pharmacies at specific points. 4. Development of medical tourism. Introduction of mobile pharmacies in tourist destinations to meet the demand of foreign visitors. 5. Interaction with international grant programs and funds.	1. Economic instability. Inflation, a decline in the purchasing power of the population can reduce demand for medicines. 2. Security problems. In regions affected by military operations, there are risks for personnel and equipment. 3. Unpredictable legislative changes. Abrupt changes in legislation can create additional barriers to business.

Thus, mobile pharmacies in Ukraine have significant potential for improving access to medical and pharmaceutical care, especially in remote areas. However, for successful implementation, logistical, economic and legal factors must be taken into account. Cooperation with government agencies, attracting investment and technological integration can significantly increase the effectiveness and sustainability of the project.

Interaction with international grant programs for the implementation of mobile pharmacy points in Ukraine can be promising, as such programs are often aimed at supporting innovation, improving access to medicine and strengthening healthcare systems in developing or crisis-affected countries.

Advantages of cooperation with international grants:

1. Financial support. Grants can cover the costs of purchasing equipment, transportation, developing logistics, and providing start-up funds for pilot projects.

2. Technical assistance. International programs usually offer expert support, including staff training, project management consulting, and assistance with compliance with international standards.

3. Expanding the partner network. Interaction with donors opens up access to new partnerships, including healthcare organizations, pharmaceutical companies, or logistics providers.

4. Strengthening trust and reputation. Participation in international grant programs demonstrates responsibility, an innovative approach, and a commitment to global standards, which can help attract additional investors.

Possible sources of funding include:

- international humanitarian organizations such as UNICEF, WHO, and Doctors Without Borders (MSF), which support initiatives related to access to medicine in crisis regions, as well as USAID, which often funds healthcare projects in Ukraine;

- European programs such as Horizon Europe, which offers grants for innovation in medicine and access to services, and the European Investment Bank,

which can support mobile healthcare initiatives in the context of combating the consequences of war.

- the United Nations Development Program (UNDP), which can finance healthcare projects aimed at the recovery and development of local communities;

- health support funds such as the Global Fund, which works to improve access to medicines to combat infectious diseases, and the Bill & Melinda Gates Foundation, which invests in innovative healthcare solutions.

To cooperate with grant programs, it is important to adhere to the following recommendations:

1. Thorough preparation of the project, including a clear strategy with a description of the goal, objectives, results and performance indicators.

2. Search for suitable grantors that support initiatives in healthcare, innovation and regional development.

3. Observing transparency regarding the use of funds and the results achieved, which is a key requirement for grantors.

4. Cooperation with local authorities can increase the chances of obtaining grants, as most donors value partnerships with government structures.

An example of a successful initiative was cooperation with USAID, which in 2022 supported several Ukrainian healthcare projects related to mobile clinics and the supply of medicines to war-affected regions. This experience can be used for further initiatives, in particular the mobile pharmacies. Attracting international grants can significantly accelerate the implementation of the project and make it sustainable in the long term.

Conclusions to the part 3

1. Analysis of the requirements for the operation of mobile pharmacies in Ukraine indicates a carefully developed regulatory framework that regulates their use to provide the population with medicines in remote regions, in territories with a state of emergency or martial law, and in zones of active hostilities. The

requirements cover both the technical characteristics of mobile pharmacies and the organizational aspects of their activities.

2. The provisions of the License Conditions emphasize the importance of mobile pharmacies for improving access to medicines in critical conditions, ensuring control over the quality of medicines, compliance with their storage conditions, and the provision of proper pharmaceutical services according to the standards stipulated by the legislation of Ukraine.

3. It is shown that the launch of mobile pharmacies in remote, frontline and deoccupied settlements of Ukraine has significantly improved the availability of medicines for the population, mobile pharmacies ensure the smooth implementation of the state program "Affordable Medicines" in the absence of stationary pharmacies.

4. The organization of the work of mobile pharmacies includes several key stages: equipping vehicles with special devices (generators, starlinks), selecting qualified personnel, training taking into account the specifics of work in crisis conditions, forming a route based on the analysis of unused prescriptions, as well as cooperation with military administrations, local authorities and health departments.

5. The range of mobile pharmacies is focused on the needs of patients with chronic diseases, including drugs for the treatment of cardiovascular diseases, diabetes, epilepsy and other chronic conditions, as well as medical devices. It also provides the ability to respond promptly to specific requests from local communities.

6. The work of mobile pharmacies in Ukraine is primarily a social initiative that does not bring financial profit to the operators, but significantly improves the quality of life of the population in crisis regions. The participation of international organizations, such as USAID, contributed to the technical support and expansion of the capabilities of this project.

7. The experience of implementing mobile pharmacies in various regions of Ukraine (Kharkiv, Kherson, Kyiv, Zaporizhia regions, etc.) was studied, which

indicates a high demand for this service and the need for further expansion of the network of mobile pharmacies to meet the needs of the population.

8. Directions for improving pharmaceutical services provided through mobile pharmacies have been identified, namely: modern equipment and technical support; route planning and cooperation with communities; expansion of the range of services; training for pharmacists in communication, pharmaceutical care, working with the elderly and the peculiarities of providing services in conditions of limited resources; digitalization of processes; integration with other medical programs, for example, with telemedicine.

9. The initial investment in mobile pharmacies is significant, but attracting grants, subsidies and government funding can ensure their long-term economic effectiveness. The results of the SWOT analysis confirm the potential of mobile pharmacies to significantly improve the availability of medical and pharmaceutical services in remote regions, despite the challenges associated with logistics, economic instability and regulatory barriers.

CONCLUSIONS

1. Emergency situations and martial law lead to disruption of the logistics supply chains of medicines, a decrease in the number of functioning pharmacies, and a shortage of medicines, which negatively affects the livelihoods of the population. 89% of rural settlements in Ukraine do not have stationary pharmacies, which complicates access to medicines. Insufficiently developed infrastructure, the inaccessibility of some settlements, and low staffing of medical personnel are critical problems affecting the provision of medicines in villages.

2. Foreign experience shows the effectiveness of adapted solutions to improve access to medicines in remote regions. Local prescription collection points and retail outlets have been introduced in Germany and Romania, and mobile pharmacies are operating in Estonia, Kazakhstan and Uzbekistan. Mobile pharmacies have proven their effectiveness during natural disasters, military operations and in difficult logistical conditions. In many countries, mobile pharmacies provide comprehensive medical services, such as vaccination, treatment of chronic diseases, prevention of opioid addiction, and support for victims of natural disasters.

3. In Ukraine, the regulatory framework allows the use of mobile pharmacies to provide the population with medicines in remote regions, in territories with a state of emergency or martial law, and in zones of active hostilities. Licensing requirements cover both the technical characteristics of mobile pharmacies and the organizational aspects of their activities, ensuring control over the quality of medicines, compliance with their storage conditions, and the provision of proper pharmaceutical services according to the standards stipulated by the legislation of Ukraine.

4. It is shown that the work of mobile pharmacies in remote and frontline settlements of Ukraine has significantly improved the availability of medicines for the population. Mobile pharmacies ensure the smooth implementation of the state program "Affordable Medicines" in the absence of

stationary pharmacies. The organization of the work of mobile pharmacies includes equipping vehicles with special devices, selecting qualified personnel, training taking into account the peculiarities of work in crisis conditions, route formation, cooperation with military administrations, local authorities and health departments.

5. The range of mobile pharmacies is focused on the needs of patients with chronic diseases, including drugs for the treatment of cardiovascular diseases, diabetes, epilepsy and other chronic conditions, as well as medical devices. There is a prompt response to specific requests from local communities.

6. The work of mobile pharmacies is primarily a social initiative that does not bring financial profit to the operators. The experience of implementing mobile pharmacies in various regions of Ukraine indicates a high demand for this service and the need for further expansion of the network to meet the needs of the population.

7. Directions for improving pharmaceutical services provided through mobile pharmacies have been identified, namely: modern equipment and technical support; route planning and cooperation with communities; expansion of the range of services; training for pharmacists in communication, pharmaceutical care, working with the elderly and the peculiarities of providing services in conditions of limited resources; digitalization of processes; integration with other medical programs (for example, with telemedicine), and others.

8. It is shown that the initial investment in mobile pharmacies is significant, but the attraction of grants, subsidies and government funding can ensure their long-term economic effectiveness. The results of the SWOT-analysis confirm the potential of mobile pharmacies, which can significantly improve the availability of medical and pharmaceutical services in remote regions, despite the challenges associated with logistics, economic instability and regulatory barriers.

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APPENDICES

Appendix A

МІНІСТЕРСТВО ОХОРОНИ ЗДОРОВ'Я УКРАЇНИ
НАЦІОНАЛЬНИЙ ФАРМАЦЕВТИЧНИЙ УНІВЕРСИТЕТ

СЕРТИФІКАТ УЧАСНИКА

Цим засвідчується, що

Lagzouli Mohamed

Scientific supervisor: Zhadko S.V.

брав(ла) участь у роботі

XXXI Міжнародної науково-практичної конференції молодих вчених та студентів

«АКТУАЛЬНІ ПИТАННЯ СТВОРЕННЯ НОВИХ ЛІКАРСЬКИХ ЗАСОБІВ»

В.о. ректора
Національного фармацевтичного
університету

МІНІСТЕРСТВО ОХОРОНИ ЗДОРОВ'Я УКРАЇНИ Національний фармацевтичний університет №02010936

Алла КОТВІЦЬКА

23-25 квітня 2025 р, м. Харків

Appendix B

МІНІСТЕРСТВО ОХОРОНИ ЗДОРОВ'Я УКРАЇНИ
НАЦІОНАЛЬНИЙ ФАРМАЦЕВТИЧНИЙ УНІВЕРСИТЕТ

АКТУАЛЬНІ ПИТАННЯ СТВОРЕННЯ НОВИХ ЛІКАРСЬКИХ ЗАСОБІВ

МАТЕРІАЛИ
XXXI МІЖНАРОДНОЇ НАУКОВО-ПРАКТИЧНОЇ
КОНФЕРЕНЦІЇ МОЛОДИХ ВЧЕНИХ ТА СТУДЕНТІВ

23–25 квітня 2025 року
м. Харків

Харків
НФаУ
2025

УДК 615.1

Редакційна колегія: проф. Котвіцька А. А., проф. Владимирова І. М.
Укладачі: Сурікова І. О., Боднар Л. А., Комісаренко М. А., Комісарова Є. Є.

Актуальні питання створення нових лікарських засобів: матеріали XXXI міжнародної науково-практичної конференції молодих вчених та студентів (23-25 квітня 2025 р., м. Харків). – Харків: НФаУ, 2024. – 515 с.

Збірка містить матеріали міжнародної науково-практичної конференції молодих вчених та студентів «Актуальні питання створення нових лікарських засобів, які представлені за пріоритетними напрямами науково-дослідної роботи Національного фармацевтичного університету. Розглянуто теоретичні та практичні аспекти синтезу біологічно активних сполук і створення на їх основі лікарських субстанцій; стандартизації ліків, фармацевтичного та хіміко-технологічного аналізу; вивчення рослинної сировини та створення фітопрепаратів; сучасної технології ліків та екстемпоральної рецептури; біотехнології у фармації; досягнень сучасної фармацевтичної мікробіології та імунології; доклінічних досліджень нових лікарських засобів; фармацевтичної опіки рецептурних та безрецептурних лікарських препаратів; доказової медицини; сучасної фармакотерапії, соціально-економічних досліджень у фармації, маркетингового менеджменту та фармакоекономіки на етапах створення, реалізації та використання лікарських засобів; управління якістю у галузі створення, виробництва й обігу лікарських засобів; суспільствознавства; фундаментальних та мовних наук.

УДК 615.1

consumers, constant resupply of the product, and prompt response to changes in demand. Effective promotion tools include advertising, personal sales, online marketing, participation in social programs, informing about promotions via SMS or messengers etc.

The final elements of the "7P" model are people, processes and physical environment, which shape the quality of interaction between the pharmacy and visitors. Staff competence, ethical service, standardized business processes, transparency of order processing and a welcoming visual environment are determining factors of the consumer experience. For example, the qualification of pharmacy staff directly affects the quality of services, since pharmacists must have communication skills, empathy, quality service, etc. The presence of internal service protocols allows you to avoid errors when dispensing, especially in the circulation of prescription drugs.

The physical surrounding, as an element of the marketing complex, creates the visual and material environment of the pharmacy. It includes interior design, product display, the presence of information stands, and lighting of the sales floor. A well-thought-out physical environment enhances the feeling of reliability and professionalism of the institution, which is especially important in the healthcare sector. The pharmacy's internal processes must be clearly regulated and standardized: from receiving goods to dispensing them, including quality control procedures, maintaining electronic prescription databases, and prompt service.

Conclusions. Effective implementation of the "7P" concept contributes to increasing the competitiveness of pharmacies, adapting activities to the current needs of consumers, as well as strengthening their loyalty. In general, optimization of the marketing complex requires a rational combination of all elements of the "7P" model in order to achieve the strategic goals of the pharmacy within the existing financial resources.

ANALYSIS OF THE OPERATION OF MOBILE PHARMACIES IN DIFFERENT COUNTRIES OF THE WORLD

Lagzouli Mohamed
Scientific supervisor: Zhadko S.V.
National University of Pharmacy, Kharkiv, Ukraine
svzhadkopharm@gmail.com

Introduction. Providing pharmaceutical care to rural and remote populations, as well as during emergencies, is a priority for healthcare systems in many countries. According to the World Health Organization, limited access to medical care in remote areas has become a critical issue in numerous regions.

Aim. The purpose of the work is to study the experience of operating mobile pharmacies in different countries of the world.

Materials and methods. The work uses descriptive and comparative methods of analyzing sources of scientific literature.

Results and discussion. In many countries, alternative pharmacy structures operate alongside traditional pharmacy establishments to ensure access to pharmaceutical care. For instance, in Japan, mobile pharmacies were introduced following the 2011 Great East Japan Earthquake and the subsequent tsunami. In 2018, the American company Walmart launched the "Big Blue" mobile pharmacy to serve populations affected by natural disasters and fires. This mobile pharmacy can be deployed on-site within approximately 30 minutes, accommodating two pharmacists and several

technicians. It is stocked with medications worth about $300,000 and includes refrigeration units for storing temperature-sensitive drugs. The pharmacy can process up to 300 prescriptions per day and, if needed, supplies vaccines against COVID-19, influenza, tetanus, as well as antihypertensive drugs and insulin.

In 2022, California enacted a law establishing mobile pharmacy units to provide pharmaceutical care to underserved communities and vulnerable populations. These units, transported via specially equipped vehicles, deliver medications to homeless individuals, residents of city- and county-owned housing, and other low-income populations. In addition to a licensed pharmacist, the mobile units include a physician who prescribes medications that can be dispensed immediately. Beginning in 2025, these mobile pharmacies will be authorized to supply and dispense medications for opioid addiction treatment, such as buprenorphine.

In Illinois, mobile pharmacies have been utilized to enhance access to medical and pharmaceutical care for cancer patients. These pharmacies allow oncologists to see patients and administer anti-cancer treatments directly at rural clinics, eliminating the need for permanent infrastructure in areas where such services are required only occasionally.

In the United States, retail pharmacies are permitted to operate as mobile units only in the state of Connecticut. These mobile pharmacies function as part of the "Integrated Mobile Opioid Therapy and Coordinated Treatment of Infectious Diseases in Your Neighborhood" (InMOTION) project. The initiative aims to provide care to individuals at risk for or living with infectious diseases, such as HIV, as well as those with substance use disorders, including opioid dependence. Professionals working in these mobile units receive specialized training to conduct testing for HIV, hepatitis C, and opioid use disorder.

In Ukraine, nearly one-third of the population resides in rural areas, yet most villages lack stationary pharmacies — approximately 89% of rural settlements do not have access to pharmaceutical care. On August 4, 2023, the Cabinet of Ministers passed Resolution No. 809, permitting the operation of mobile pharmacies in rural areas without a stationary pharmacy, in emergency zones, and in territories affected by active military conflict. The first mobile pharmacies were introduced in Ukraine in 2024, with product assortments including essential medications for patients with chronic diseases. For example, diabetic patients can access insulin, oral hypoglycemic drugs, test strips, lancets, glucometers, and other necessary supplies.

Conclusions. The analysis of international experience highlights the vital role of mobile pharmacies in improving access to pharmaceutical care. These mobile units enhance the availability of both pharmaceutical and medical services, particularly for socially vulnerable populations, and provide a model for adaptation in various countries.

ANALYSIS OF TRENDS AND FEATURES OF THE DEVELOPMENT OF THE GLOBAL STATIN MARKET

Suaaidi Soufiane
Scientific supervisor: Zhadko S.V.
National University of Pharmacy, Kharkiv, Ukraine
svzhadkopharm@gmail.com

Introduction. According to the World Health Organization, cardiovascular disease (CVD) is the leading cause of morbidity and mortality worldwide. Statins, or HMG-CoA reductase inhibitors,

National University of Pharmacy
Faculty pharmaceutical
Department of management, marketing and quality assurance in pharmacy
Level of higher education master
Specialty 226 Pharmacy, industrial pharmacy
Educational and professional program Pharmacy

APPROVED
The Head of Department
of Management,
Marketing and Quality
Assurance in Pharmacy

_____
Volodymyr MALYI
"2" of September 2024

ASSIGNMENT
FOR QUALIFICATION WORK
OF AN APPLICANT FOR HIGHER EDUCATION

Mohamed LAGZOULI

1. Topic of qualification work: «Analysis of the experience of operating mobile pharmacies in different countries», supervisor of qualification work: Svitlana ZHADKO**,** PhD, assoc. prof.

approved by order of NUPh from "27th" of September 2024 № 237

2. Deadline for submission of qualification work by the applicant for higher education: May 2025.

3. Outgoing data for qualification work: scientific literature, regulatory and legal framework for retail trade of medicines and reimbursement; statistical data.

4. Contents of the settlement and explanatory note (list of questions that need to be developed): to study and summarize data from scientific literature on the problem of ensuring access to medicines for the population in emergency situations and in remote areas; to analyze foreign experience in organizing pharmaceutical assistance to the population in remote areas; to conduct a review of additional services of mobile pharmacies abroad; to study licensing requirements for the activities of mobile pharmacies in Ukraine; to analyze the features of organizing the work of mobile pharmacies in Ukraine; to identify areas for improving the work of mobile pharmacies in Ukraine; to analyze the economic component and conduct a SWOT analysis of the implementation of mobile pharmacies in Ukraine.

5. List of graphic material (with exact indication of the required drawings):
Tables – 2, figures – 7

6. Consultants of chapters of qualification work

Chapters	Name, SURNAME, position of consultant	Signature, date	
		assignment was issued	assignment was received
1	Svitlana ZHADKO, assistant professor of department of management, marketing and quality assurance in pharmacy	09.09.2024	09.09.2024
2	Svitlana ZHADKO, assistant professor of department of management, marketing and quality assurance in pharmacy	18.11.2024	18.11.2024
3	Svitlana ZHADKO, assistant professor of department of management, marketing and quality assurance in pharmacy	03.02.2025	03.02.2025

7. Date of issue of the assignment: «02» September 2024

CALENDAR PLAN

№ з/п	Name of stages of qualification work	Deadline for the stages of qualification work	Notes
1	Collection and generalization of data from the scientific literature in the areas of qualification work (part 1)	October 2024	**Done**
2	Analysis of foreign experience in organizing pharmaceutical care to the population in remote areas (part 2)	November 2024	**Done**
3	Directions for improving the work of mobile pharmacies in Ukraine (part 3)	February 2025	**Done**
4	Writing and design of a qualification work	April 2025	**Done**
5	Approbation of a qualification work	May 2025	**Done**
6	Submission of a qualification work to the EC of NUPh	May 2025	**Done**

An applicant of higher education _____ Mohamed LAGZOULI

Supervisor of qualification work _____ Svitlana ZHADKO

ВИТЯГ З НАКАЗУ № 237

По Національному фармацевтичному університету

від 27 вересня 2024 року

Затвердити теми кваліфікаційних робіт здобувачам вищої освіти 5-го курсу Фм20(4,10д) 2024-2025 навчального року, освітньо-професійної програми – Фармація, другого (магістерського) рівня вищої освіти, спеціальності 226 – Фармація, промислова фармація, галузь знань 22 Охорона здоров'я, денна форма здобуття освіти (термін навчання 4 роки 10 місяців), які навчаються за контрактом (мова навчання англійська та українська) згідно з додатком № 1.

Прізвище, ім'я здобувача вищої освіти	Тема кваліфікаційної роботи		Посада, прізвище та ініціали керівника	Рецензент кваліфікаційної роботи
по кафедрі менеджменту, маркетингу та забезпечення якості у фармації				
Лагзулі Мохамед	Вивчення досвіду функціонування мобільних аптек у різних країнах світу	Analysis of the experience of operating mobile pharmacies in different countries	доц. Жадько С.В.	проф. Назаркіна В.М.

Ректор

Вірно Секретар

ФА2.8-03-317

ВИСНОВОК

експертної комісії про проведену експертизу
щодо академічного плагіату у кваліфікаційній роботі

здобувача вищої освіти

«30» квітня 2025 р. № 331090755

Проаналізувавши кваліфікаційну роботу здобувача вищої освіти Лагзулі Мохамед, групи Фм20(4.10) англ-02, спеціальності 226 Фармація, промислова фармація, освітньої програми «Фармація» навчання на тему: «Вивчення досвіду функціонування мобільних аптек у різних країнах світу / Analysis of the experience of operating mobile pharmacies in different countries», експертна комісія дійшла висновку, що робота, представлена до Екзаменаційної комісії для захисту, виконана самостійно і не містить елементів академічного плагіату (компіляції).

Голова комісії,
проректор ЗВО з НПР,
професор **Інна ВЛАДИМИРОВА**

Ф А 2.2.1-32-353

REVIEW

of scientific supervisor for the qualification work of the master's level of higher education of the specialty 226 Pharmacy, industrial pharmacy

Mohamed LAGZOULI

on the topic: «Analysis of the experience of operating mobile pharmacies in different countries»

Relevance of the topic. The topic is highly relevant in the modern era, as in recent decades, natural disasters have increasingly caused instability worldwide. In many countries, limited access to healthcare in remote areas has become a critical issue. Ensuring access to medicines and pharmaceutical care in rural and emergency-affected regions is a key healthcare priority. In Ukraine, only 11% of villages have pharmacies, and residents of over 20,000 rural settlements must travel long distances to buy medicines. The situation is especially difficult in de-occupied and frontline areas, where pharmacies are often absent or destroyed. Mobile pharmacies can play a vital role in improving access to medicines in such areas.

Practical value of conclusions, recommendations and their validity. The results of the study are of great importance for pharmacy chains, government organizations, and international humanitarian organizations in planning and implementing projects to introduce mobile pharmacies.

Assessment of work. **Mohamed LAGZOULI** conducted significant research work and successfully coped with it, showed the ability to analyze and summarize the data of literary sources, to work independently. The results of research are properly interpreted and illustrated in tables and figures. In performing the qualification works, the higher education seeker showed creativity, purposefulness, independence, perseverance.

General conclusion and recommendations on admission to defend. Qualification work of the 5th year student of higher education of the group Phm20(4,10д)eng-02 Mohamed LAGZOULI on the topic «Analysis of the experience of operating mobile pharmacies in different countries» is a completed research study, which in terms of relevance, scientific novelty, theoretical and practical significance meets the requirements for qualification works, and can be submitted to the EC of NUPh.

Scientific supervisor _____ Svitlana ZHADKO

«14» of May 2025

Ф А 2.2.1-32-356

REVIEW

of scientific supervisor for the qualification work of the master's level of higher education of the specialty 226 Pharmacy, industrial pharmacy

Mohamed LAGZOULI

on the topic: «Analysis of the experience of operating mobile pharmacies in different countries»

Relevance of the topic. According to the WHO report on the regulatory framework for community pharmacies in the WHO European Region, in many countries the problem of inadequate access to healthcare in remote areas is critical. The work of mobile pharmacies can significantly improve pharmaceutical assistance to the rural population and during emergencies.

Theoretical level of work. The author summarized data from the scientific literature on the problem of public access to medicines during emergencies, status and problems of pharmaceutical provision for the rural population in Ukraine.

Author's suggestions on the research topic. Strengths and weaknesses, threats and opportunities for the implementation of mobile pharmacies in Ukraine are identified, recommendations are developed for expanding the list of pharmaceutical services provided by mobile pharmacies and improving their quality.

Practical value of conclusions, recommendations and their validity. The results of the qualification work are of great importance for pharmacy chains and government organizations in planning and implementing projects to introduce mobile pharmacies in different countries.

Disadvantages of work. As a remark, it should be noted that some of the results of the literature review, which are presented in the first section, need stylistic refinement. In general, these comments do not reduce the scientific and practical value of qualifying work.

General conclusion and assessment of the work. The qualification work of Mohamed LAGZOULI on the topic «Analysis of the experience of operating mobile pharmacies in different countries» is a science-based analytical study that has theoretical and practical significance. Qualification work meets the requirements for qualification work and can be submitted to the EC of the National University of Pharmacy.

Reviewer _____ prof. Victoria NAZARKINA

«15» of May 2025

Ф А2.2.1-91-287

МІНІСТЕРСТВО ОХОРОНИ ЗДОРОВ'Я УКРАЇНИ
НАЦІОНАЛЬНИЙ ФАРМАЦЕВТИЧНИЙ УНІВЕРСИТЕТ

ВИТЯГ З ПРОТОКОЛУ № 15

16 травня 2025 року

м. Харків

засідання кафедри менеджменту, маркетингу
та забезпечення якості в фармації

Голова: завідувач кафедри ММЗЯФ, доктор фарм. наук, професор Малий В. В.

Секретар: доцент ЗВО, канд. фарм. наук, доц. Жадько С.В.

ПРИСУТНІ: зав. кафедри ММЗЯФ, доктор фарм. наук, проф. Малий В.В., професор ЗВО, докт. фарм. наук, проф. Пестун І.В., професор ЗВО, докт. фарм. наук, проф. проф. Літвінова О.В., професор ЗВО, докт. фарм. наук, проф. проф. Коваленко С.М., професор ЗВО, докт. фарм. наук, проф. Крутських Т.В., професор ЗВО, докт. фарм. наук, проф. проф. Посилкіна О.В., доцент ЗВО, канд. фарм. наук, доц. Бабічева Г.С., доцент ЗВО, канд. фарм. наук, доц. Бондарєва І.В., канд. екон. наук, доц. Гладкова О.В., канд. екон. наук, доц. Глєбова Н.В., канд. екон. наук, доц. Деренська Я.М., доцент ЗВО, канд. фарм. наук, доц. Жадько С.В., канд. фарм. наук, доц. Зборовська Т.В., канд. юрид. наук, доц. Коляда Т.А., канд. екон. наук, доц. Ковальова В.І., канд. фарм. наук, доц. доц. Лісна А.Г., доцент ЗВО, канд. фарм. наук, доц. Малініна Н.Г., доцент ЗВО, канд. фарм. наук, доц. Рогуля О.Ю., асистент, канд. фарм. наук Шуванова О.В., здобувачі вищої освіти фармацевтичного факультету

ПОРЯДОК ДЕННИЙ: Про допуск здобувачів вищої освіти випускного курсу фармацевтичного факультету спеціальності 226 Фармація, промислова фармація, освітньо-професійної програми Фармація до захисту кваліфікаційних робіт в Екзаменаційній комісії НФаУ.

СЛУХАЛИ: Про допуск здобувача вищої освіти випускного курсу фармацевтичного факультету спеціальності 226 Фармація, промислова фармація, освітньо-професійної програми Фармація групи Фм20(4,10д)англ-02 Мохамед ЛАГЗУЛІ до захисту кваліфікаційної роботи в Екзаменаційній комісії НФаУ. Кваліфікаційна робота на тему «Вивчення досвіду функціонування мобільних аптек у різних країнах світу».

ВИСТУПИЛИ: В обговоренні кваліфікаційної роботи взяли участь докт. фарм. наук, проф. Пестун І.В., канд. фарм. наук, доц. Бондарєва І.В., канд. фарм. наук, доц. Рогуля О.Ю. Керівник кваліфікаційної роботи: доцент ЗВО кафедри ММЗЯФ, канд. фарм. наук, доц. Жадько С.В.

УХВАЛИЛИ: Допустити здобувача вищої освіти Мохамед ЛАГЗУЛІ до захисту кваліфікаційної роботи на тему «Вивчення досвіду функціонування мобільних аптек у різних країнах світу» в Екзаменаційній комісії НФаУ.

Зав. каф. ММЗЯФ, доктор фарм. наук,
професор Володимир МАЛИЙ

Секретар
канд. фарм. наук, доцент Світлана ЖАДЬКО

Ф А2.2.1-32-042

НАЦІОНАЛЬНИЙ ФАРМАЦЕВТИЧНИЙ УНІВЕРСИТЕТ

ПОДАННЯ
ГОЛОВІ ЕКЗАМЕНАЦІЙНОЇ КОМІСІЇ
ЩОДО ЗАХИСТУ КВАЛІФІКАЦІЙНОЇ РОБОТИ

Направляється здобувач вищої освіти Мохамед ЛАГЗУЛІ до захисту кваліфікаційної роботи
за галуззю знань 22 Охорона здоров'я
спеціальністю 226 Фармація, промислова фармація
освітньо-професійною програмою Фармація
на тему: «Вивчення досвіду функціонування мобільних аптек у різних країнах світу».

Кваліфікаційна робота і рецензія додаються.

Декан факультету _____ / Микола ГОЛІК /

Висновок керівника кваліфікаційної роботи

Здобувач вищої освіти Мохамед ЛАГЗУЛІ виконав на кафедрі менеджменту, маркетингу та забезпечення якості у фармації НФаУ кваліфікаційну роботу, яка присвячена вивченню досвіду функціонування мобільних аптек у різних країнах світу.

У першому розділі роботи описано проблему доступу населення до фармацевтичної допомоги під час надзвичайних ситуацій та у відділених районах. У другому розділі проаналізовано досвід фармацевтичної допомоги населенню у відділених районах у низці країн. У третьому розділі визначені напрями вдосконалення роботи мобільних аптечних пунктів в Україні.

У цілому подана до захисту кваліфікаційна робота Мохамед ЛАГЗУЛІ на тему «Вивчення досвіду функціонування мобільних аптек у різних країнах світу» відповідає вимогам, що висуваються до кваліфікаційних робіт, оцінюється позитивно і може бути рекомендована для захисту в Екзаменаційній комісії НФаУ.

Керівник кваліфікаційної роботи

_____ Світлана ЖАДЬКО

«14» травня 2025 р.

Висновок кафедри про кваліфікаційну роботу

Кваліфікаційну роботу розглянуто. Здобувач вищої освіти Мохамед ЛАГЗУЛІ допускається до захисту даної кваліфікаційної роботи в Екзаменаційній комісії.

Завідувач кафедри
менеджменту, маркетингу
та забезпечення якості у фармації

_____ Володимир МАЛИЙ

«16» травня 2025 р.

Qualification work was defended

of Examination commission on

« » of June 2025

with the grade _____

Head of the State Examination commission,

DPharmSc, Professor

_____ / Volodymyr YAKOVENKO /