World Health Organization

European Region

Results of initial health labour market analysis in Ukraine

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Abstract

The Government of Ukraine aims to develop a robust health system providing high-quality, free services to all citizens and aligning with European Union standards. Key to this goal is strengthening the health workforce, which has been significantly impacted by the COVID-19 pandemic and the invasion by the Russian Federation. WHO supported Ukraine's Ministry of Health by conducting a Health Labour Market Analysis to address key policy questions on workforce development. The analysis presented by this report revealed a number of challenges including health worker shortages, geographic maldistribution, and an insufficient primary health care workforce. This report provides main recommendations on further steps for health workforce strengthening in Ukraine.

Keywords

HEALTH WORKFORCE; HEALTH LABOUR MARKET ANALYSIS; HUMAN RESOURCES FOR HEALTH; UKRAINE

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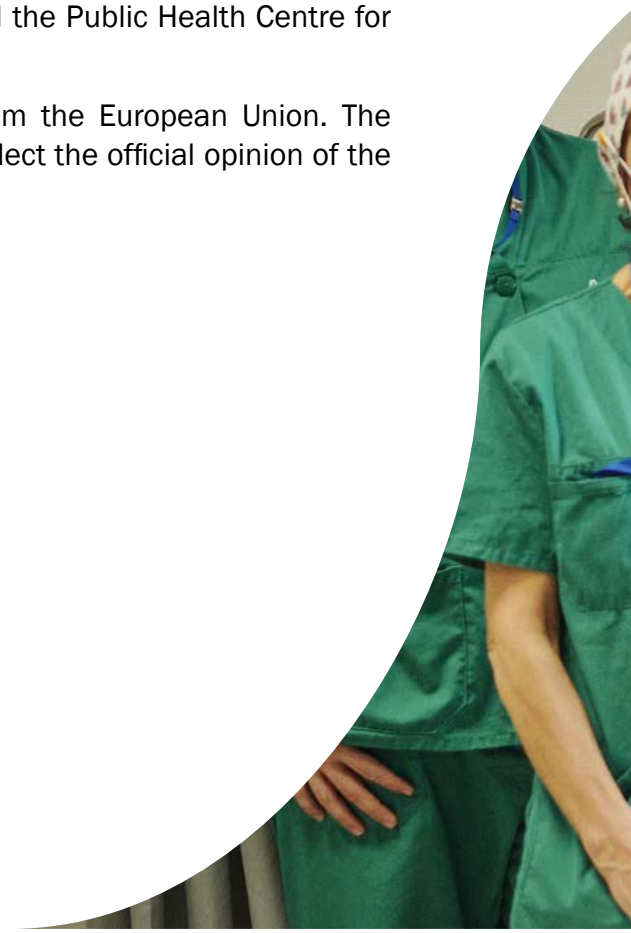

Abbreviations

CO	Country Office
COVID-19	coronavirus disease
EU	European Union
GDP	gross domestic product
HLMA	Health Labour Market Analysis
HRH	human resources for health
hrv	hryvnia (Ukrainian)
JDC	joint data collection
MoH	Ministry of Health
NHSU	National Health Service of Ukraine
NHWA	National Health Workforce Accounts
PHC	primary health care
PPP	purchasing power parity

Executive Summary

Introduction

The Government of Ukraine is committed to building a stronger health system that can deliver high-quality health services to all who need them, free of charge, and fulfill the requirements for the integration of Ukraine into the European Union (EU). The health workforce was identified as a key area to safeguard and strengthen to build a stronger and more resilient health system. The COVID-19 pandemic and the invasion by the Russian Federation have caused adverse impacts on Ukraine's health systems, especially its health workforce. To respond to the current challenges and future expectations regarding the health workforce, there is a need to identify priority areas and policy interventions that Ukraine should implement. However, very limited data and assessments are available on the current health workforce in Ukraine. In the absence of such analysis, it may not be feasible to identify the appropriate priorities and policies for the health workforce.

WHO provides comprehensive support to the Ministry of Health (MoH) to strengthen health systems. Following a request from the MoH, WHO conducted a Health Labour Market Analysis (HLMA) and stands ready to provide support for the translation of policy recommendations and guidance from the *Global Strategy on Human Resources for Health* and *Framework for action on the health and care workforce in the WHO European Region 2023–2030* into tailored country actions.

Key policy questions for the HLMA in Ukraine include the following.

1. How does the health workforce of Ukraine compare to that in the EU?
2. What is the situation of health workforce availability and distribution in Ukraine?
3. Is Ukraine producing enough health workers?
4. Is the primary health care (PHC) workforce in Ukraine adequate?
5. How does the situation of the health workforce in regions directly affected by war compare with the rest of Ukraine?

Methodology and sources of data

WHO's Health labour market analysis guidebook was used to guide the analysis. The report primarily relies on analysis of aggregate data through descriptive statistics. The data on health workers was disaggregated by oblast, by sex, by ownership of health facilities (public sector and private sector) and by level of care (primary level and hospital level).

The analysis was based on descriptive comparison of indicators expressed as proportions (percentages) or densities (number per unit population). The density of health workers was compared with other EU countries to assess the adequacy of Ukraine's health workforce. The adequacy of the health workforce in Ukraine was also assessed through the proportion of vacant positions in relation to the approved positions of health workers. Changes in the health workforce were assessed by examining the trend in the number of health workers from 2015 to 2023. Changes were also assessed by calculating the proportion of health workers leaving the health workforce (attrition) annually. On the supply side, the main data used was the number of health professionals graduating as well as the number entering courses.

The quantitative analyses were complemented with qualitative observations obtained by interacting with a few key informants from the MoH. A review of recent literature on the health systems and workforce of Ukraine was conducted to supplement the findings from data analysis. A number of WHO publications from 2020 to 2024 were a key source of secondary information.

The data for analysis was provided by the MoH, Ukraine and National Health Service Ukraine (NHSU). Prior to data collection, discussions were held with the MoH and NHSU. The data from the NHSU was for the years 2020, 2021, 2022 and 2023 (up to September). The data from the NHSU was based on information it routinely collects from the public and private health-care facilities contracted by it. The MoH collected data on health workers from the regions (oblasts) for 2020, 2021 and 2022. The third set of data on the Ukraine health workforce was the annual *kadry* bulletins by the Public Health Centre of the MoH, available from 2014 to 2022 (except 2020). For doctors, dentists and physiotherapists, NHSU data was found to be closer to being complete and, therefore, was used for the HLMA. For nurses and midwives, the MoH data was used because it was more complete. For vacancies, MoH data was used. For long-term trend (from 2014 to 2022), the annual bulletins of the Public Health Centre were used. For recent changes or attrition in the health workforce, all three datasets were simultaneously used to ensure triangulation.

For the education of health workers, the data for the years 2020 to 2023 was collected by the MoH from the Ministry of Education. The annual *kadry* bulletins

of the Public Health Centre (2014 to 2018) also included data on the education of health workers, which was analyzed.

For assessment, the HRH indicators of Ukraine were compared with those from other EU countries (EU27). The data on the HRH indicators of EU countries was taken from the *Joint Data Collection* (JDC) database on human resources, updated for most countries up to 2021 or 2020. For countries where the JDC did not have data, the data available from the *National Health Workforce Accounts* (NHWA) report was used.

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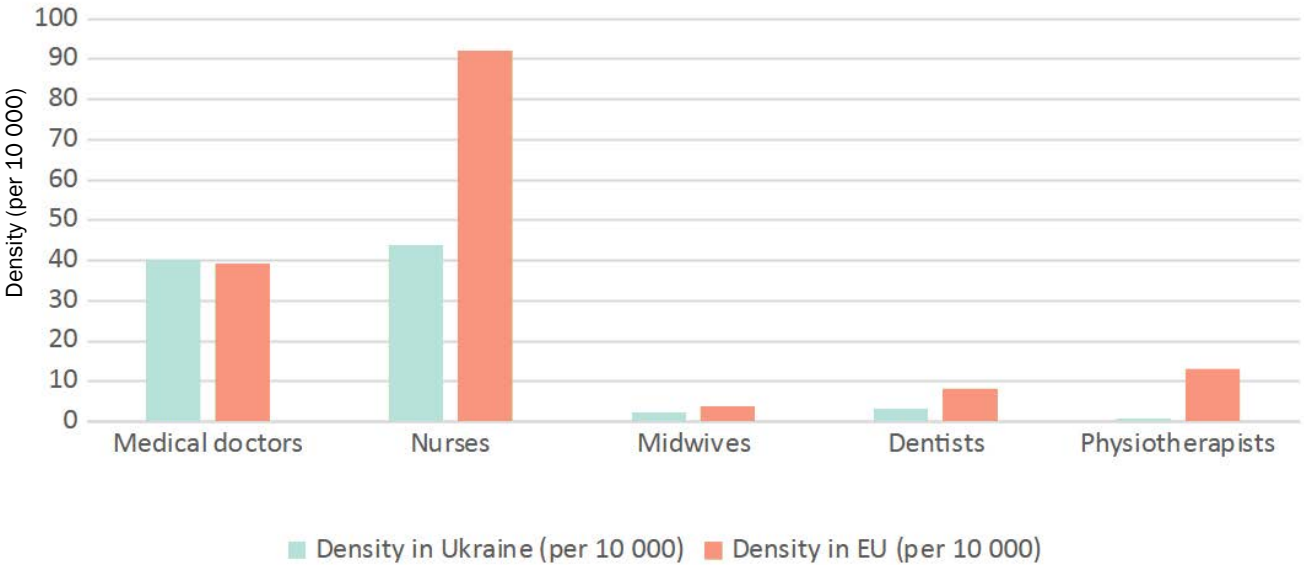
Main findings

1. How does the health workforce of Ukraine compare to that in the EU?

Ukraine has a density of doctors similar to the EU average density. However, it is far behind the EU in the density of nurses, midwives and physiotherapists. Due to its lower number of nurses, the nurse to doctor ratio in Ukraine is 1.1 compared to 2.3 in the EU (Fig. 1). The actual density of dentists in Ukraine is likely to be greater than presented here if the private sector data becomes adequately captured.

Fig.1. Density of some occupations of health workers – Ukraine vs EU



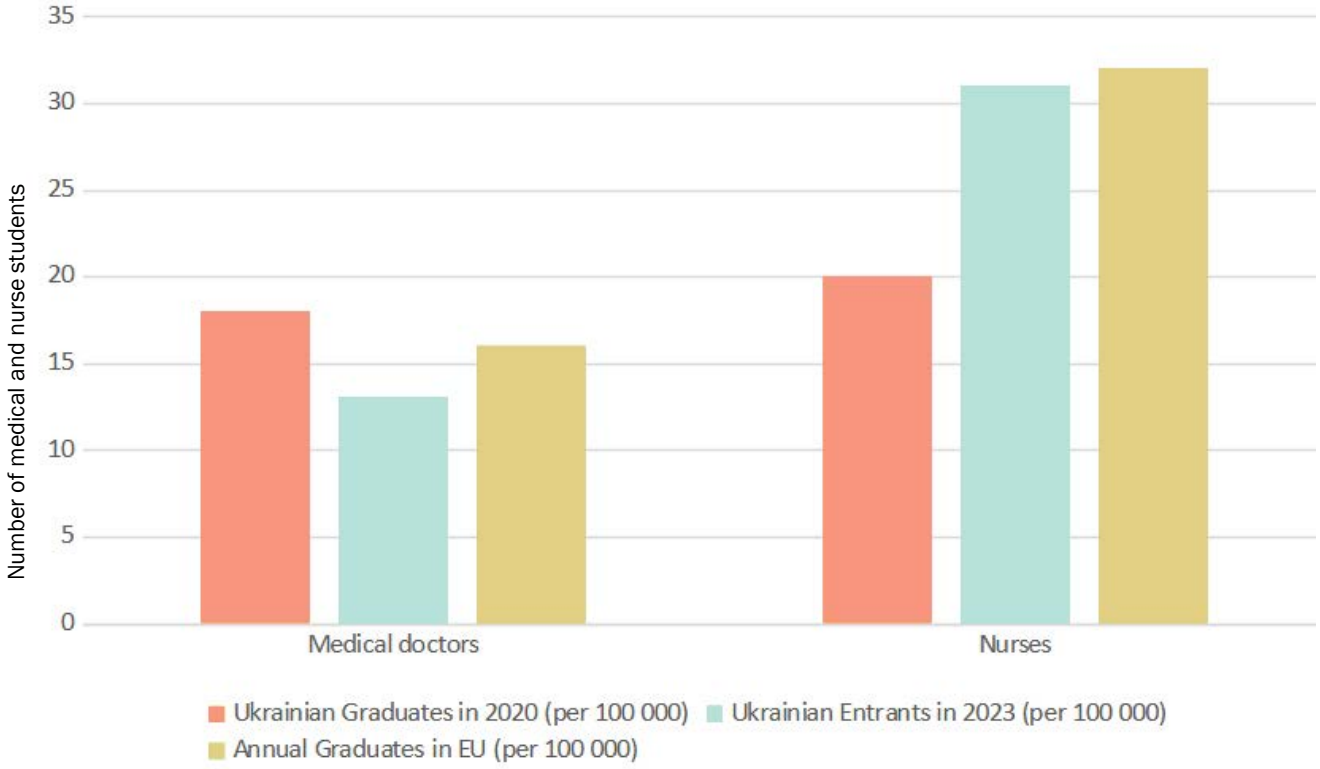
Source: Ukraine data is from NHSU (September 2023) for medical doctors, midwives, dentists and physiotherapists; Ukraine nurses' data is from MoH (2022), EU countries data (2020–21) from JDC and from NHWA for countries with no data in JDC

A comparison of health worker production in Ukraine and the EU found the following.

Medical graduates. Ukraine produces more medical graduates per 100 000 population than the EU average, but around two thirds of the admissions were of foreign students until 2021. If only Ukrainian medical graduates are considered, the number was still slightly greater in 2020 than the EU average of 16 per 100 000. The number of admissions into medical schools declined in 2023 and there were 13 Ukrainian entrants per 100 000 population into medical schools.

Nursing graduates. Ukraine produces 20 nurses annually per 100 000 population, which is around 37% less than the EU average (32 per 100 000). According to MoH data, the number of admissions in nursing has increased in the last three years. The number of entrants into nursing per 100 000 population in Ukraine in 2023 was similar to the annual number of graduates per 100 000 in the EU in 2020 (Fig. 2).

Fig. 2. Number of medical and nurse students – Ukraine vs EU



Source: Ukraine data is from MoH, EU countries data (2020-21) from JDC and from NHWA for countries with no data in JDC.

2. What is the situation of health worker availability and distribution in Ukraine?

The overall number of doctors was stagnant from 2014 to 2019 but started declining from 2019. Even though the number of doctors in the private sector increased, the overall number declined due to falling public deployment. Ukraine has been losing around 3% or 5000 of its doctors annually since 2019. Certain key specialties related to trauma care, epidemiology and mental health have a shortage of doctors.

The number of nurses in Ukraine has been declining since 2015. Compared to 2015, Ukraine had 30% less nurses in 2022. Since 2017, the number of nurses has been declining by around 6%, which is around 11 000 nurses per year. In recent years after the start of the war, the rate of decline has become faster.

For vacant positions, results included the following.

In 2022, around 25% of the existing positions of doctors were vacant, as per MoH data; and 20% as per Public Health Centre data. According to the bulletins of the Public Health Centre, most (three quarters) of doctor vacancies were concentrated in facilities providing services mainly to the rural population. According to the bulletins of the Public Health Centre, the vacancies of doctors under the MoH were 24 691 in 2019, which grew to 29 221 in 2021, and further to 31 657 by the end of 2022. This represents a 28% increase in vacancies during this period.

As of 1 January 2023, 1733 positions of internists, 1262 positions of pediatricians, 1126 positions of surgeons, 1073 positions of obstetrician-gynecologists, 1797 positions of anesthesiologists, 3189 positions of family doctors, 819 positions of laboratory doctors, and 963 positions of dentists were vacant (data from Public Health Centre bulletins). In 2022, 15% of nurse positions were vacant (MoH data). Vacancies were also high among other cadres, including laboratory technicians, X-ray technicians, and midwives, with around 10–20% positions vacant (MoH data).

Aging is one of the principal causes of attrition. More than half of the PHC doctors were above 50 years of age and 29% were above age of 60 years. Around a quarter of all doctors are of retirement age. This also indicates low rates of public recruitment in the past decade. Another cause of attrition is migration. The workforce is highly feminized, and it is easier for female health workers to migrate. The health workforce was declining in the pre-COVID-19 period, too, but the rate has increased after COVID-19 and the war.

Regarding the geographical distribution of the existing health workforce:

Around 30% of the population of Ukraine lives in rural areas but only 17% of PHC doctors and 7% of all nurses are working in rural areas; three quarters of the existing vacancies are in facilities that provide services mainly to rural population; and there are differences in health worker density between oblasts; for example, doctor density in Mykolaiv is half of that in Kyiv city.

3. Is Ukraine producing enough health workers?

Results included the following.

Annual admissions for doctors in Ukraine declined 27% from around 11 000 in 2015 to 8000 in 2019. The number of international as well as the domestic self-funded entrants into medical schools declined further with the war. According to MoH data, 5744 Ukrainian and 182 international students were admitted into medical schools in 2023. The medical universities are facing a severe financing crisis due to the decline in international students. Annual admissions for doctors funded by the Ukraine Government declined 30% from around 5000 in 2015 to 3500 in 2019 and has remained stagnant (below 4000) until 2023. Further, only 13% of the government budget-funded and 2% of the self-funded medical graduates specialized in family medicine in the period 2020–2023.

The annual admissions for nursing in Ukraine declined 33% from around 8300 in 2015 to 5300 in 2019 according to the bulletins of the Public Health Centre. The MoH data, however, shows a 15% increase in admissions into nursing during the period from 2020 to 2023 and this data is likely to be accurate as it was collected by the MoH from the Ministry of Education.

4. Is the PHC workforce in Ukraine adequate?

Results included the following.

Ukraine has three cadres as PHC doctors – family doctors (67%), therapists (14%) and paediatricians (19%). The PHC workforce is small in relation to the overall health workforce in Ukraine. Only 17% of doctors and 19% of nurses work in PHC. The EU has a similar average, where 20% of doctors are general practitioners. PHC doctor density in Ukraine is 5.5 per 10 000, whereas it is 8.9 per 10 000 in the WHO European Region. Services and HRH skills for physiotherapy, oral health, mental health, long-term care, and social work appear to be largely missing in PHC facilities.

A family doctor is expected to cover a maximum of 1800 persons by Ukraine standards, but 26% of them are actually covering more than 1800 persons (declarations[1]). Around 20% positions of PHC doctors are vacant and a large share of these is in rural areas. PHC doctors are an aging workforce; more than half were above 50 years of age and 29% were above the age of 60.

The following is a comparison of the density of workers in rural areas with that in urban areas per 10 000 people: for PHC doctors, it is half (4 vs 8.1); for nurses, it is six times lower (8.7 vs 48.1); for midwives (0.3 vs 2.6), dentists (0.3 vs 3.7), and physiotherapists (0.2 vs 1.8) – the numbers are miniscule in rural areas.

[1] A declaration is a document stating that a patient wants to be treated by a particular doctor.

5. How does the situation of the health workforce in regions directly affected by conflict compare with the rest of Ukraine?

Results included the following.

Doctor density is lower in many government-controlled parts of partially occupied and de-occupied regions (oblasts). The NHSU observed a notable decrease in the family doctor numbers in areas with partial occupation. For example, in Luhansk oblast between 2021 and 2023, there was an 18% decline in family doctors and an 8% decrease in specialists. Nurse density is lower in most partially occupied and de-occupied regions. The biggest decrease in nurses was registered by the NHSU in de-occupied and partially occupied regions. For example, from 2021 to 2023, there was a 10% decline in Mykolaiv, 8% in Donetsk, 6% in Luhansk. The proportion of nurses working in PHC out of total nurses was lower in the partially occupied regions and some of the de-occupied regions.MoH data, however, shows a 15% increase in admissions into nursing during the period from 2020 to 2023 and this data is likely to be accurate as it was collected by the MoH from the Ministry of Education.

Key issues emerging from the HLMA

1. Health worker shortages

Although Ukraine and the EU have a similar density of doctors, the numbers in Ukraine are very low in some key specialties, such as those related to emergency and trauma care, epidemiology, and mental health. Compared to EU countries, Ukraine has a significantly lower density of nurses, midwives and physiotherapists. The ratio of nurses to doctors is quite low in Ukraine in comparison to the EU average.

2. Declining trend in number of health workers deployed

The number of doctors and nurses in Ukraine have been falling overall since 2016. There is a persistent trend of a high rate of attrition among nurses. The decrease is most pronounced in public sector deployment. It is likely that many doctors and nurses prefer to migrate abroad. The war has led to increased rates of international migration. Many nurses in the country are working in non-health professions. The remuneration in public sector jobs is not attractive for doctors and nurses and many facilities are not keen to recruit due to financial constraints.

The aging of health workers is a concern. While more than half of family doctors are likely to retire in a decade or so, the intake may not be enough as compensation. An aged workforce also indicates that the number of public recruitments has been low.

There is a significant movement of specialist doctors from the public to the private sector – 1% to 3% per annum – which may cause a shortage in the public sector in a few years. Although the private sector is relatively small today, it is growing rapidly, especially in urban areas.

Existing policies on attracting and retaining health workers, including for remuneration, may be insufficient. As a consequence of current financing policy at the PHC level – of declarations (capitation) linked to doctors in PHC facilities – there is little incentive for PHC facilities to hire nurses. Another study by WHO on the time use of the PHC workforce showed that nurses had to spend a significant part of their time on non-clinical tasks, such as entering data.

3. Vacancies

Around 10% to 25% of positions are vacant for doctors, nurses, midwives, physiotherapists, laboratory technicians, and X-ray technicians.

4. Issues in the production of health workers

The medical schools are facing a decline in finances because the fees from international students formed a major share of their funding before the conflict. The admissions of self-funded Ukrainian students have also declined sharply in 2023. It is likely that many are preferring to study abroad. It could be related to the uncertainty caused by the war and the rising preference to migrate.

The shortage of specialists in a few key specialties, such as family medicine, emergency medicine, mental health, anesthesia, intensive care and epidemiology, could be due to low production. Family medicine is not a preferred specialization for self-funded students. Among government budget-funded medical graduates, 13% are in family medicine. The production of family doctors does not match well with the need for PHC.

5. Geographical maldistribution

The density of health workers is extremely low in rural areas, including at the PHC level. A large proportion of existing vacancies are concentrated in rural areas. The density of health workers in oblasts directly affected by the conflict is low and has suffered greater attrition.

6. Inadequate PHC workforce

Less than a fifth of doctors and nurses are deployed in PHC work. There is a shortage of PHC doctors, as reflected in the following: vacancies are around 20%, doctors are aging, around a quarter of family doctors exceed the norm of 1800 declarations, and there is a lower density of PHC doctors in comparison to the EU region average. Family medicine appears to be a less preferred specialization as only 2% of the self-funded medical interns were in family medicine. Among government budget-funded students, 13% were in family medicine.

Many necessary skills for comprehensive PHC seem to be missing in PHC teams, as they consist mainly of family doctors and nurses and their current training does not cover many crucial areas of care.

7. Weak systems for data collection and analysis on HRH

The current systems are inadequate in collecting routine data on many important elements of HRH, such as the education of various types of health workers, migration of health workers, number of recruitments, number of retirements, and age of health workers. Many data elements are collected on-demand or on an ad-hoc basis. As a result, the periodic analysis of HRH and monitoring of trends or changes becomes difficult. This can hamper HRH planning and evidence-based policy-making for a stronger health workforce.

There are multiple versions of data collected by the MoH and NHSU. There are sometimes wide variations in data reported by different channels; for instance, the number of nurses graduating in a year varied substantially between the *kadry* bulletins and the data collected by the MoH.

The NHSU is gradually building a system to collect HRH information, but it is limited to the facilities contracted by it. Recently, regulations have been introduced, making it mandatory for all medical facilities, irrespective of ownership, to report data on the e-health platform of the NHSU but it remains to be seen how well it will be enforced. Many health workers working in the private sector are likely to get missed in the current data collection system. This is particularly true for dentists and physiotherapists and, to some extent, nurses.

8. Impact of the conflict on the health workforce in Ukraine

The health workforce in areas directly affected by the conflict has been affected the most. But the conflict has impacted the health workforce in all of Ukraine. The adverse impact is on many crucial aspects of HRH, ranging from education and absorption to increased migration and challenges in the retention of health workers, leaving a depleted health workforce in many parts of the country.

There is evidence of increased emigration of doctors, nurses and other health professionals from Ukraine since the conflict started. Countries receiving the refugee population, including health workers, had to facilitate accessible pathways for the Ukrainian health workers to be able to practice. It has become more difficult for Ukrainian health facilities to attract and retain health workers.

The sharp decline in the admissions of international students has severely affected the finances of medical education institutions. The admissions of self-funded Ukrainian medical students have fallen significantly, and this could be related to the uncertainty caused by the conflict.

Recommendations

1. Strengthening the human resources information system

There is a need to set up a system whereby the necessary data on HRH is collected routinely and is analysed periodically to inform HRH planning and policy-making. Among the existing systems, the NHSU database holds the most promise to capture the data on HRH. Its key strength is that it collects annual data with the individual health worker as a unit. The NHSU is primarily a purchasing or financing agency and playing a stewardship role with respect to HRH may not be part of its defined responsibilities. As a result, the NHSU collects information on HRH that covers only currently deployed health workers. Its defined role does not involve collecting data on many other crucial HRH dimensions, such as the education or migration of health workers. The MoH does play a stewardship role for HRH but has limited data to support its work. The MoH and NHSU should collaborate so that relevant data is collected routinely and utilized for analysis, leading to strengthened HRH in Ukraine through evidence-based planning and policy-making. For data on education, an agreement is needed between the ministries of education and health so that the Ministry of Education provides data regularly to the MoH.

2. Aligning HRH strategies with PHC and other national health systems' priorities and policies

The Ukraine MoH has decided to move towards a PHC-oriented approach to develop its health systems. If PHC is a clear priority, the HRH strategies should be aligned with it. A crucial milestone can be to ensure primary care for NCDs through the current structure of PHC teams consisting of family doctors and nurses. The existing teams can also play a role in mental health and other priority needs in PHC with appropriate additional training.

In the longer run, there will be many kinds of services that need to be integrated to achieve comprehensive PHC. The PHC teams need skills in many areas, such as rehabilitation, mental health, public health emergencies, oral health, social work, nutrition and long-term care. Strengthening the PHC workforce may be required in the longer run to create multidisciplinary and multiskilled PHC teams. This in turn will require changes in the training of health workers to suit the demands of PHC. Also, if an increase in health workers' deployment is planned, it can be aligned with the HRH requirements of PHC and needs of rural areas.

In addition to the changes in the PHC teams, there may be a need to consider an increase in the hospital workforce in order to meet some of the current priorities; namely, specialist doctors and other health workers trained and deployed in a few key areas, such as emergency and trauma care, rehabilitation and mental health.

3. Optimizing existing occupations in the health workforce

The roles in which many of the health workers are currently deployed may not be utilizing the workers' full scope of practice. Expanding the roles of some occupations, such as nurses, can be considered. Although this analysis could not cover the *feldshers*[2], steps to optimize their roles can also be explored. Nurses often spend a considerable amount of time on non-clinical tasks, such as entering data, thereby reducing their availability for actual service delivery. If other assistants can be added to the workforce to take such tasks away from qualified nurses, this would allow for better utilizing the skills of qualified nurses and could make public sector jobs more satisfying and attractive to them.

4. Identifying and overcoming barriers to the public sector recruitment of available health workers

The production of nurses and doctors does not appear to be the bottleneck. Rather, there is a need to strengthen the deployment of available nurses and doctors as low public sector recruitment over the last decade appears to be a key bottleneck in the country. Public recruitment appears to have been in decline for a decade and the situation became worse due to the impact of the COVID-19 pandemic and the conflict. The aging health workforce also indicates low recruitment in recent decades. The analyses undertaken in this HLMA point towards the possibility that many health workers graduating recently are not getting absorbed by the public sector.

5. Comprehensive measures needed for improving retention in rural areas and frontline regions

There is little doubt that the availability of health workers in rural areas is far poorer than in urban areas. This has implications for PHC. In order to recruit and retain enough health workers in rural areas, comprehensive strategies need to be implemented – detailed guidance is available in the updated guidelines of WHO on the rural retention of HRH, which includes a bundle of strategies that are not limited to increasing financial incentives. Strategies will be needed to cover the areas of education, regulation, incentives and personal and professional support. While it is clear that the frontline regions will require measures to improve retention, further efforts are recommended to develop the suitable strategies.

[2] For some post-Soviet countries, *feldsher* is the common definition of a person, belonging to the nursing staff, who is a doctor's assistant or sometimes provides medical care independently in paramedic stations.

6. Strengthening government financing for health worker education

The medical schools in Ukraine depend heavily on international students to finance their basic requirements. This dependence of medical schools resulted in a funding crunch after the conflict started and the number of international students decreased sharply. An increase in government funding to public sector medical schools needs to be considered so that they can retain their teaching faculty.

Furthermore, the number of government budget-funded admissions has remained stagnant while the number of admissions of self-funded medical students declined sharply in 2023. An increase in the number of government budget-funded admissions in public sector medical schools to compensate for the decline in self-funded admissions can be considered.

The recommended increase in government budget-funded admissions can be further useful if it is aligned with increased production of the type of specialists that have a larger shortage in relation to the need. Given the low preference for family medicine among self-funded medical students, budget-funding a larger number of doctors in family medicine would help in meeting the number needed for PHC. Budget-funding can be used as a lever to increase production in other high-priority areas also, such as emergency medicine, anesthesia, intensive care, epidemiology and mental health. The admissions into physiotherapy have increased recently as a result of government priority and there may be a case to increase it further.

7. Undertaking further dialogue and analysis to identify root causes of HRH gaps

The current HLMA exercise was carried out with some limitations of data, including some key dimensions, such as the migration of health workers. Apart from the limitations of data availability, further investigation is needed to identify the contextual factors that have contributed to the various gaps in HRH pointed out by this HLMA. The current HLMA offers a baseline and starting point for evidence-based preparation of HRH strategies in Ukraine. Further dialogue with stakeholders and analysis is recommended to find out the root causes of the HRH gaps in the country. Such analysis will clarify the policies needed for building a strong health workforce in Ukraine, capable of meeting the health needs of its population.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Introduction

Ukraine is a large country located in eastern Europe. Its population was estimated to be around 41.6 million in 2021 *(1)*. It is classified as a lower middle-income country by the World Bank *(2)*. Its per capita gross domestic product (GDP) in purchasing power parity (PPP) terms in the year 2022 was US$ 12 675 in comparison to the EU average of US$ 54 625 *(3)*.

Similar to many European countries, Ukraine faces an aging population and a large burden of noncommunicable diseases. As per the Global Burden of Disease study (2007–2017), the top causes of death in Ukraine include coronary heart disease, cancers, stroke, self-harm, cirrhosis of the liver, hypertensive cardiopathy, diabetes, chronic obstructive pulmonary disease and Alzheimer's disease *(4)*.

While the country has made significant progress in maternal and child health, certain challenges remain (Table 1).

Table 1: Selected indicators on health and mortality for Ukraine compared with EU average

Indicator	Ukraine	EU
Estimated life expectancy at birth, female (years) (2019)	77.8	83.8
Estimated life expectancy at birth, male (years) (2019)	68.0	78.4
Estimated infant mortality rate (2019) (per 1000 live births)	7.2	3.4
Maternal mortality ratio (per 100 000 live births) (2017)	19	6

Source: European Health Information Gateway portal *(5)*

In 2014, Ukraine's per capita government health expenditure in PPP terms was US$ 584, which was around six times lower than the EU average of US$ 3540 in the same year *(6)*. In Ukraine in 2017, the government health expenditure constituted 46% of the total health expenditure *(7)*. In 2017, the total health expenditure was around 7.4% of the GDP *(7)*. In 2017, out-of-pocket payments constituted a high proportion (53%) of the current health expenditure *(7)*. In 2022, health-care spending per capita decreased in real terms by 12.8% from the 2021 level, due to the macro-economic impact of the Russian invasion *(8)*.

Health facilities and providers in Ukraine are mostly part of the public sector *(7)*. The private health-care sector is relatively small but has shown rapid growth in recent years. In 2018, reforms were introduced to offer health-care guarantees and allowing the government to contract public and private health-care facilities. A purchaser organization, called the NHSU, was established for this purpose *(7)*.

The full-scale invasion of Ukraine by the Russian Federation in February 2022 has intensified the challenges faced by the health system. Ukraine's infrastructure has suffered extensively, making it increasingly difficult to maintain health services in conflict-affected areas. Maintaining health services in conflict-affected areas is a challenge. Many health facilities have suffered serious damage. One of the most crucial areas in which Ukraine's health systems face a challenge regards the health workforce. Health workers who work or are deployed in conflict areas do so in tremendously difficult conditions.

Over the last decade, Ukraine started reforms in its health systems, which were accelerated from 2018 onwards. Ukraine wants to build a stronger health system that can deliver health services to meet the needs of its population. Ukraine aspires to reach a level of health care similar to countries in the EU. It has identified the health workforce as a key area to safeguard and strengthen in order to build stronger and more resilient health systems. In order to respond to current challenges and future expectations for the health workforce, there is a need to identify the appropriate priority areas and policy interventions that Ukraine can pursue. However, very limited data and assessments are available on the current health workforce in Ukraine. In the absence of such analysis, it may not be feasible to identify the appropriate priorities and policies on the health workforce. Moreover, the Third Rapid Damage and Needs Assessment (RDNA3) also identified a lack of relevant data on human resource needs in different sectors, including health, and emphasized the necessity for additional investments in these types of studies *(9)*.

WHO has partnered with Ukraine's MoH to strengthen the country's health systems. The joint efforts have seen an upswing since the war started. In order to address the gap in analysis and assessments, several exercises and studies have been initiated. In August 2023, it was agreed that an assessment of the health workforce situation and future needs should be undertaken with WHO support. Based on the suggestion from the WHO Regional Office for Europe, it was agreed that the MoH would conduct a Health Labour Market Analysis (HLMA) supported by the WHO Country Office (CO) in Ukraine.

Key policy questions for the HLMA in Ukraine include the following.

1. How does the health workforce of Ukraine compare to that in the EU?
2. What is the situation of health workforce availability and distribution in Ukraine?
3. Is Ukraine producing enough health workers?
4. Is the primary health care (PHC) workforce in Ukraine adequate?
5. How does the situation of the health workforce in regions directly affected by war compare with the rest of Ukraine?

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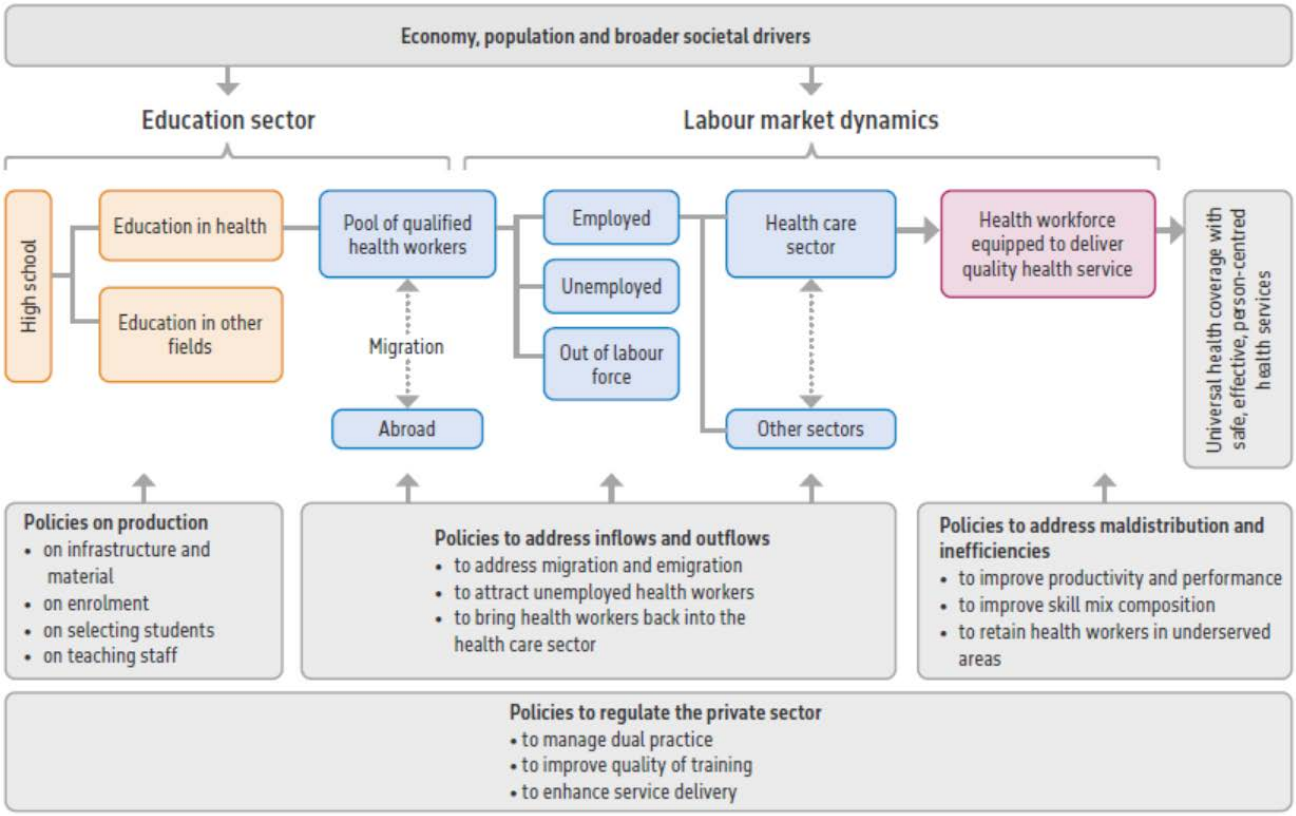
Methods

HLMA framework

WHO's Health labour market analysis guidebook was used to guide the analysis *(10).* The guidebook provides the framework that shows how the health labour market relates to the goal of universal health coverage (Fig. 3).

Fig. 3. Health labour market framework for universal health coverage



Source: European Health Information Gateway portal *(5)*

The HLMA framework is useful as it can help in clarifying the main bottlenecks or HRH gaps and issues. It helps in identifying the key bottleneck that an HRH gap is related to, for instance, whether it is inadequate production, poor absorption, poor retention or migration. For example, if current health workers are not being deployed, increasing the production of health workers may not be useful. Similarly, if the problem is retaining the existing health workforce in rural areas, merely increasing production may not always be the answer.

Regarding data analysis and interpretation, this report relies primarily on analysis of aggregate data through descriptive statistics. The key data used for analysis were on the stock and flow of health workers in selected occupations in Ukraine. The data on health workers was disaggregated by oblast, by sex, by ownership of health facilities (public sector and private sector) and by level of care (primary level and hospital level). The analysis was based on descriptive comparison of indicators expressed as proportions (percentages) or densities (number per unit population). The comparisons were done between Ukraine and other countries, between years, between public and private sectors employing health workers, between oblasts. and between levels of care.

The density of health workers was compared with other EU countries to assess the adequacy of Ukraine's health workforce. The adequacy of the health workforce in Ukraine was also assessed through the proportion of vacant positions in relation to the approved positions of health workers. Changes in the health workforce were assessed by examining the trend in the number of health workers from 2015 to 2023. Changes were also assessed by calculating the proportion of health workers leaving the health workforce (attrition) annually. On the supply side, the main data used was the number of health professionals graduating as well as the number entering the courses. The data analysis was conducted in MS-Excel.

The quantitative analyses were complemented with qualitative observations obtained by interacting with a few key informants from the MoH. The qualitative part mostly pertained to the context and policies underlying the health workforce situation in Ukraine.

There were some crucial areas for which data was not available, such as the migration of health workers or age distribution of health workers. A review of recent literature on the health systems and workforce of Ukraine was conducted to supplement the findings from data analysis. A number of WHO publications from 2020 to 2024 were a key source of secondary information.

Sources of data

The main sources of data on health workers in Ukraine were the MoH and NHSU. Before starting the HLMA, discussions on the data requirements and the status of their availability were held with the MoH and by the WHO CO in the first week of October 2023. Based on the discussions, a list of required data points was prepared. The list included data on health workers in the occupations of PHC doctors, specialist doctors, nurses, midwives, dentists, physiotherapists, occupational therapists and laboratory technicians. The data list covered the following areas:

1. number of health workers (head count) disaggregated by gender, age, ownership (public/private), level of care (primary vs secondary/tertiary), geography (rural/urban) and region (oblast) as of 1 September of 2020, 2021, 2022 and 2023;
2. number of health workers leaving the workforce during the years of 2021 and 2022 and the first nine months of 2023;
3. number of vacancies in health worker positions; and
4. number of health workers being produced annually (number of admissions and graduates).

It was conveyed by the MoH and NHSU that they did not have data on the migration of health workers.

The WHO CO issued official requests to the MoH and NHSU for providing the data. In response, the MoH and NHSU provided the data in MS-Excel format to the WHO CO.

The NHSU had started capturing data on health workers from 2019. Initially, the data was limited to doctors and those working in the public sector. In 2020, the NHSU started capturing data on nurses working in secondary/tertiary level facilities. Gradually, private sector facilities were also asked to report their health worker information. In 2022, the NHSU started capturing data on nurses working at the PHC level and also on other occupations, such as dentists, physiotherapists and laboratory technicians.

According to the NHSU, they were able to capture nearly complete data on doctors in the public sector in 2023 but they expected incomplete data (approximately up to 20%) for other occupations. The data on the private sector health workforce was also estimated to have a similar gap. The data gap was larger in the years before 2022. The NHSU was able to provide disaggregated data except on the age of health workers. For the age of the health workforce, secondary data from a study by WHO on PHC in 2021 was used.

The NHSU did not have data on vacancies.

For nurses and midwives, there was a bigger gap in the numbers captured by the NHSU system and, therefore, this was supplemented by the data available from the MoH on nurses and midwives. For now it is better to use MoH data as the information is more relevant.

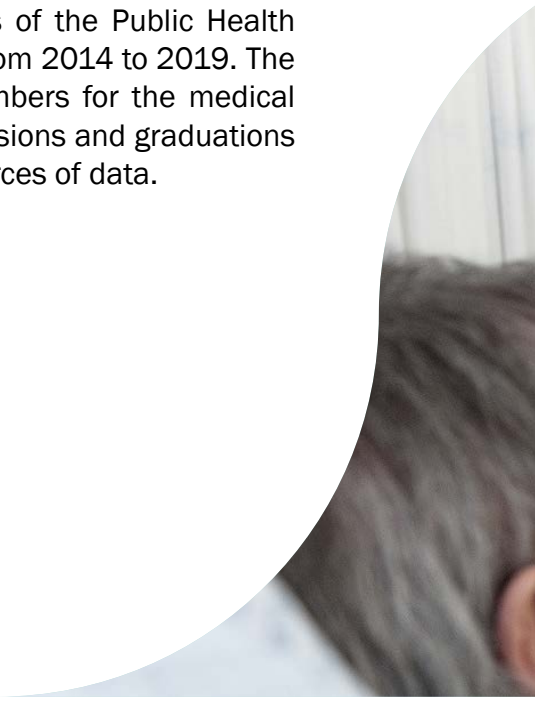
The MoH collected data on the different occupations of health workers, but this was disaggregated only on two of the required lines: outpatient/inpatient care and oblast. The data provided by MoH nurses and midwives captured more numbers than the NHSU data and therefore seemed to be closer to being complete. Thus, this data was used for reporting the density of nurses and midwives.

The MoH also shared the annual bulletins on the health workforce (*kadry* bulletins) in Ukraine that are compiled by the Public Health Centre, an institution under the MoH. These bulletins were available from 2014 onwards up to 2022 (except 2020). The data available in the bulletins was used to analyse the long-term trend (2014 to 2022) in the occupations of doctors, dentists and nurses. It was also used to triangulate the analysis on attrition among doctors and nurses.

A limitation of all the above data sources is that data on the health workforce in the private sector is incomplete. The NHSU collects data only from the facilities that are contracted by it. The gap is likely to be significant for occupations such as dentists and physiotherapists where a majority may be practicing in the private sector.

Another key limitation relates to the data available of the HRH working in the areas affected directly by the Russian invasion. The analysis presented here is based on the number of health workers reflected in NHSU records. The number of health workers actually working in such areas may be lower than what the NHSU database reflects. Particularly, the data on HRH in areas occupied by Russia may not reflect the current situation.

On the education of health workers, the MoH collected data from the Ministry of Education, and this included data on the number of admissions and graduates in nursing schools and the medical and physiotherapy faculties of universities and institutes, for the period 2020 to 2023. The bulletins of the Public Health Centre have information on health worker production also from 2014 to 2019. The two datasets (*kadry* bulletins vs MoH) showed similar numbers for the medical admissions and graduates. However, the numbers on admissions and graduations of nurses differed widely between the above-mentioned sources of data.



The population data required was for the total population of Ukraine, disaggregated by oblast and rural/urban population. As there has been no population census in Ukraine in recent times, the latest official projections available from the Statistics Office of Ukraine, from 2021, were used for the HLMA. This data is from the pre-war period. The overall population of Ukraine changed significantly after the war due to international migration. The population at oblast level might have undergone even more drastic changes due to internal and international migration. However, no official estimates were available from the MoH on the current population in Ukraine and its distribution across oblasts. There are a few estimates available now from agencies of United Nations that indicate the scale of the impact of war on the population. The pre-war population of Ukraine was estimated at 43.3 million in January 2022 but fell to 35.6 million by July 2023. While many Ukrainians subsequently returned, in November 2023 there were still 6.2 million Ukrainians registered abroad, of which 94% were registered in Europe. In addition, another 3.7 million were internally displaced, half of them originating from two oblasts: Kharkiv (22%) and Donetsk (24%).

For assessment, the HRH indicators of Ukraine were compared with those from other EU countries (EU27). The data on the HRH indicators of EU countries was taken from the Joint Data Collection (JDC) database on human resources, updated for most countries up to 2021 or 2020 *(11)*. For countries where the JDC did not have data, the data available from the National Health Workforce Accounts (NHWA) report was used. The above approach was consistent with the "Health and Care Workforce in Europe: Time to Act" report of WHO Regional Office for Europe published in 2021 *(12)*.

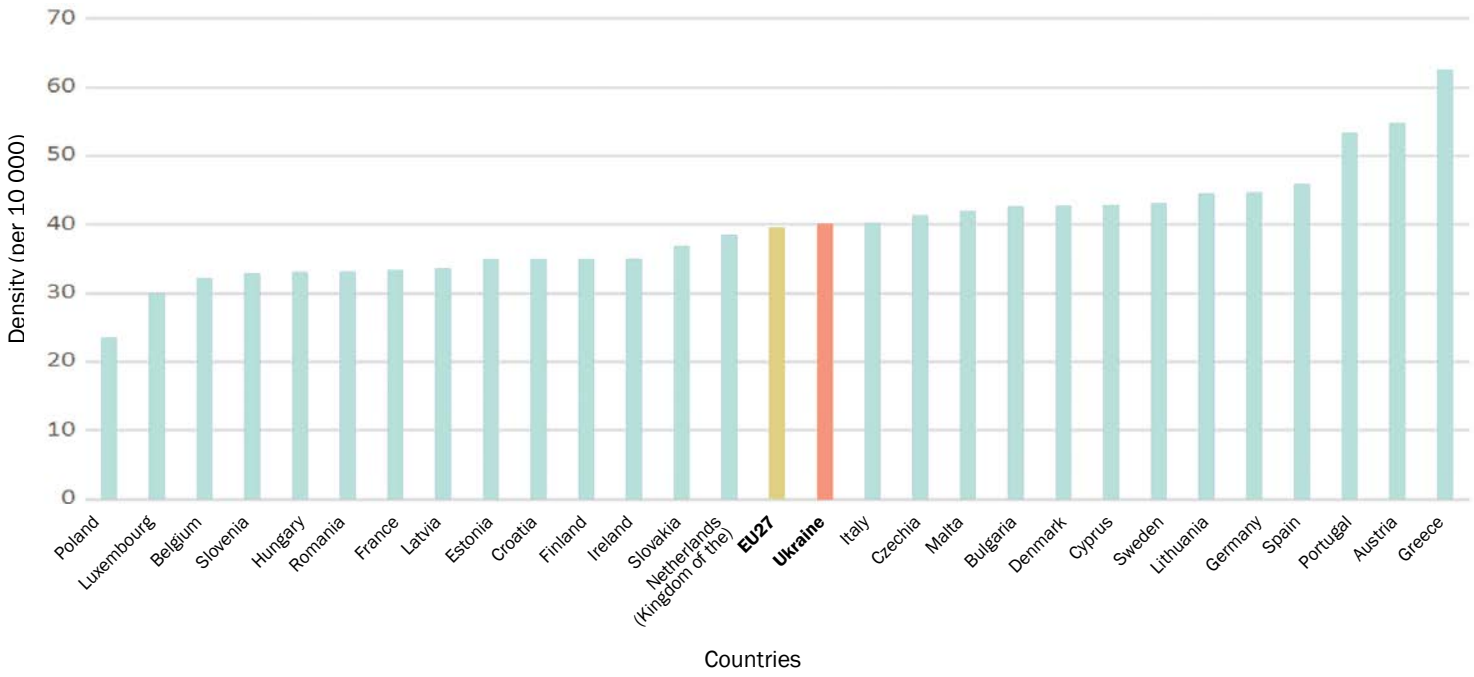
Findings

1. How does the health workforce of Ukraine compare to that in the EU?

1.1 Medical doctors

The density of doctors in Ukraine was 40 per 10 000 population (September 2023). This is similar to the EU countries' average, which was 39 per 10 000 (2020–2021) (Fig.4).

Fig. 4. Density of medical doctors in Ukraine and EU countries



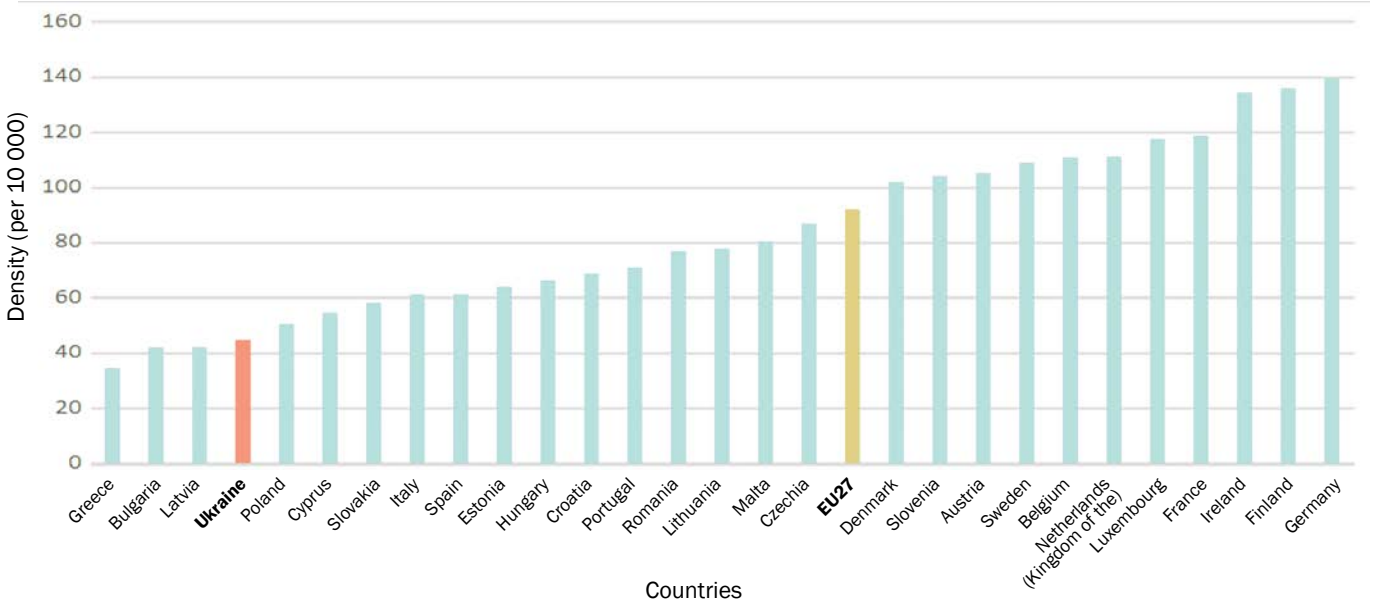
Source: Ukraine data from NHSU (September 2023); EU countries' data (2020–2021) from JDC, and from NHWA for countries with no data in JDC

EU27 stands for European Union that has consisted of 27 countries since 1 February, 2020

1.2 Nurses

The density of nurses in Ukraine was 43.8 per 10 000 population (September 2022). This was around half of the EU countries' average, which was 92 per 10 000 (2020–2021) (Fig.5).

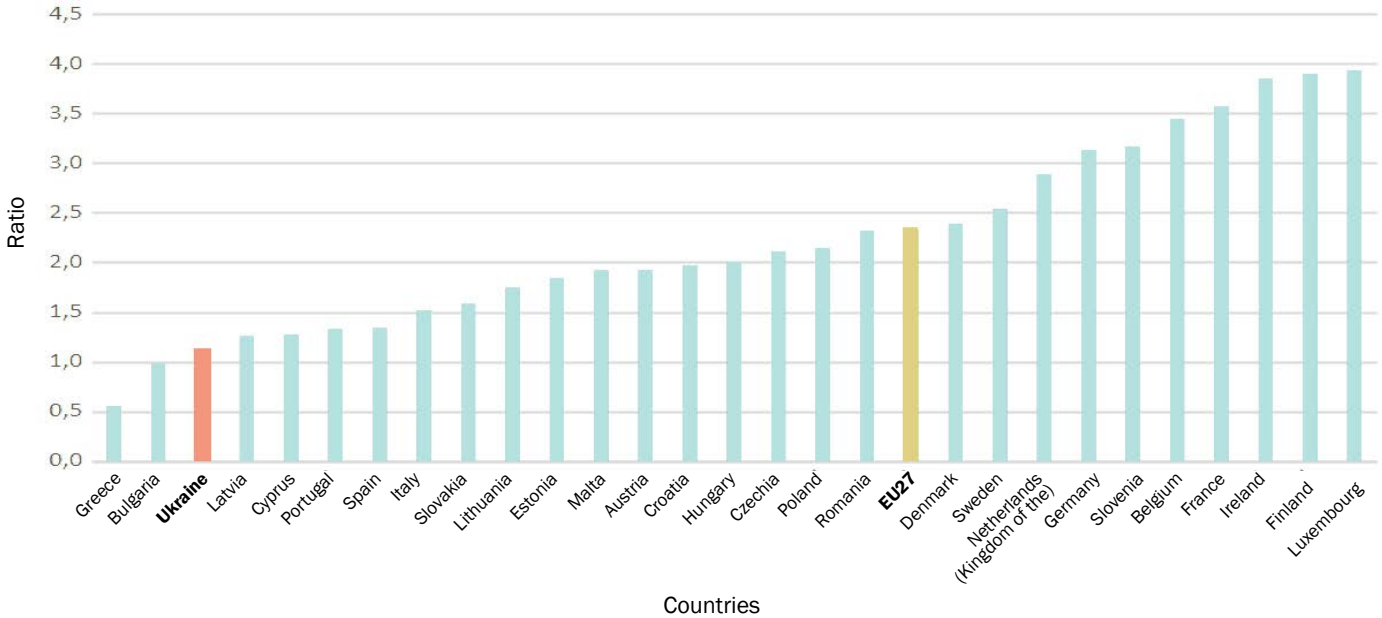
Fig. 5. Density of nurses in Ukraine and EU countries



Source: Ukraine data from MOH (2022); EU countries' data (2020–21) from JDC, and from NHWA for countries with no data in JDC

The ratio of nurses to doctors is also low in Ukraine. While the EU has a nurse to doctor ratio of 2.3, it is half of that in Ukraine at 1.1 nurses per doctor (Fig. 6).

Fig. 6. Nurse to doctor ratio in Ukraine and EU countries



Source: Ukraine data from MOH (2022); EU countries' data (2020–2021) from JDC, and from NHWA for countries with no data in JDC

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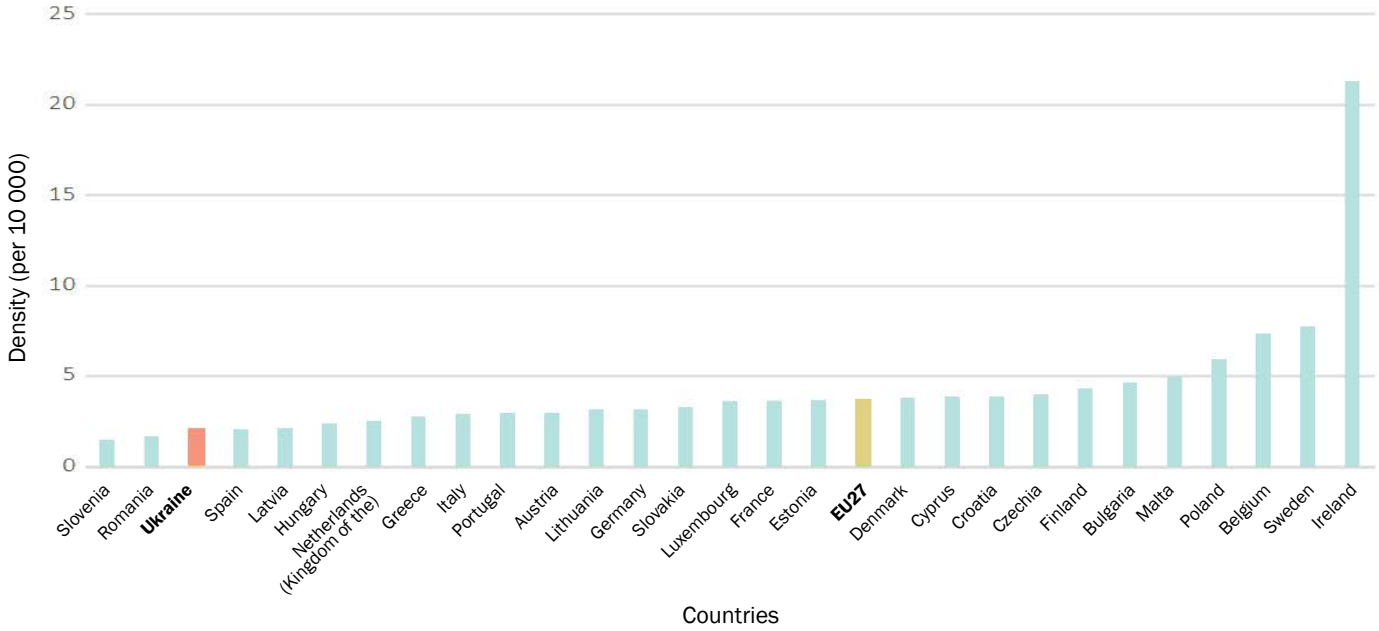
1.3 Midwives

The density of midwives in Ukraine was 2.1 per 10 000 population (September 2022). This was around half of the EU countries' average, which was 3.6 per 10 000 (2020–2021) (Fig. 7).

Fig. 7. Density of midwives in Ukraine and EU countries

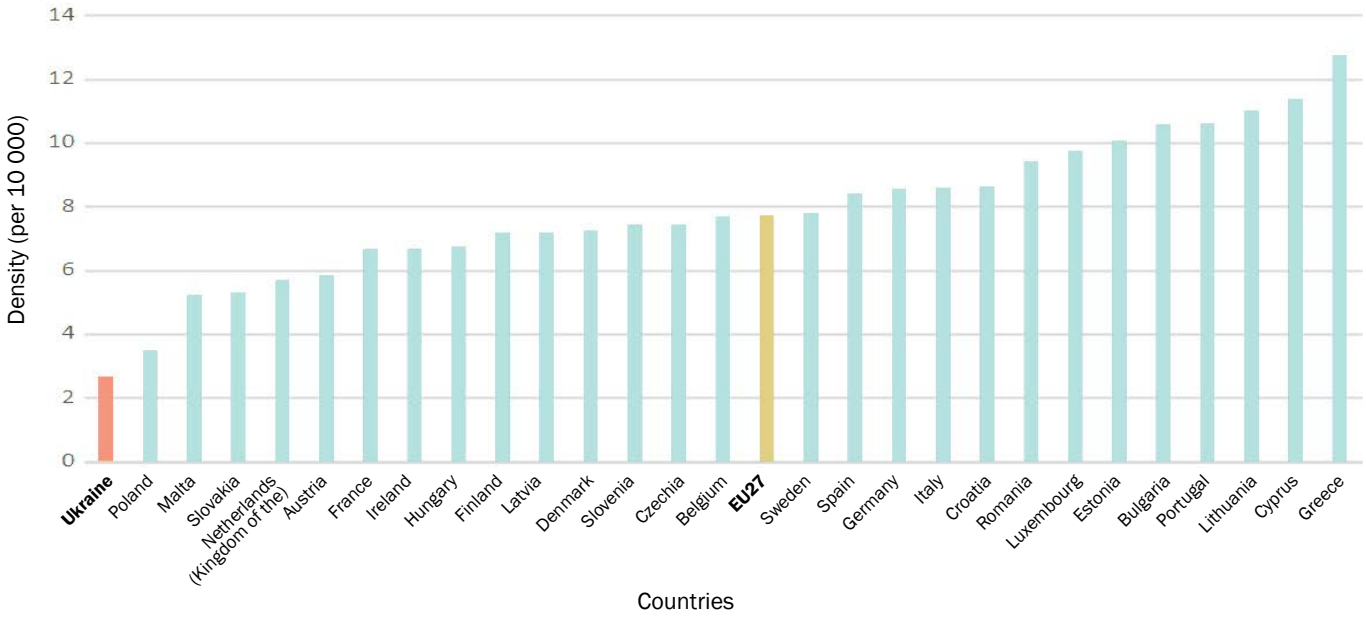


Source: Ukraine data from MOH (2022); EU countries' data (2020–2021) from JDC, and from NHWA for countries with no data in JDC

1.4 Dentists

The density of dentists in Ukraine was 3.1 per 10 000 population (September 2023). This was less than half of the EU countries' average, which was 8 per 10 000 (2020–2021) (Fig. 8). This number of dentists in Ukraine is likely to be an underestimate as a majority of dentists work in private practices and they are not covered well in the NHSU data. If we take that into account, Ukraine may not be too far behind the EU average in dentist density.

Fig. 8. Density of dentists in Ukraine and EU countries

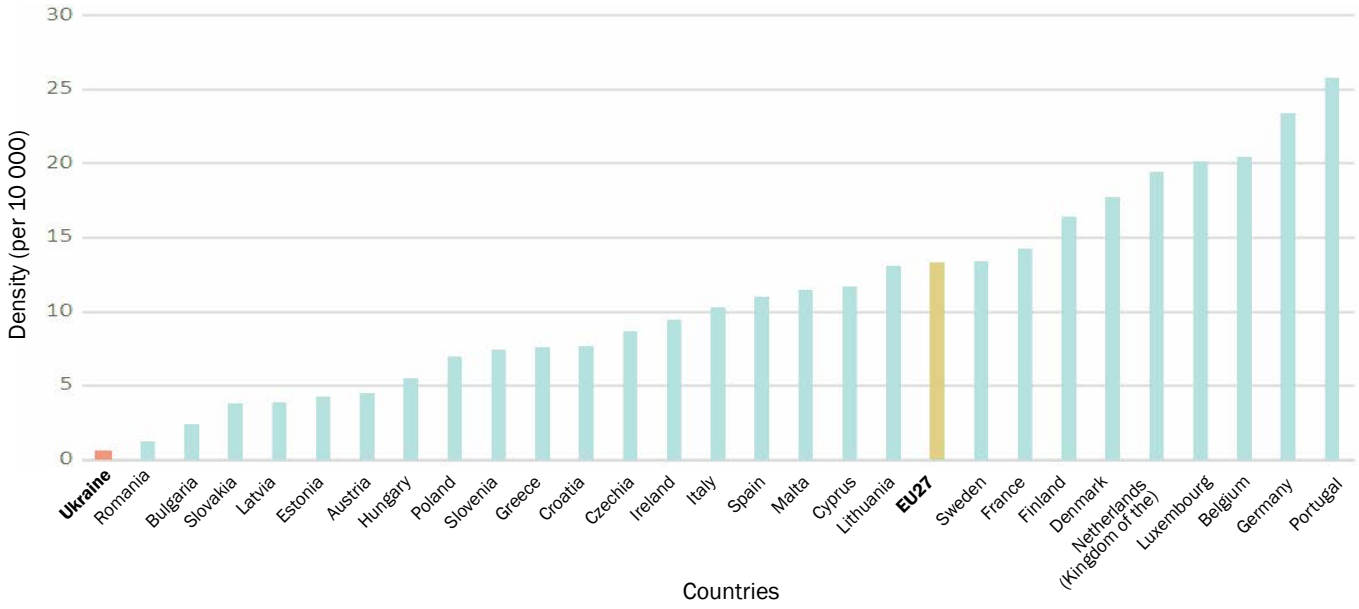


Source: Ukraine data from MOH (2022); EU countries' data (2020–2021) from JDC, and from NHWA for countries with no data in JDC

1.5 Physiotherapists

The density of physiotherapists in Ukraine was 0.5 per 10 000 population (September 2023). This was around 25 times lower than the EU countries' average, which was 13 per 10 000 (2020–2021) (Fig. 9).

Fig. 9. Density of physiotherapists in Ukraine and EU countries



Source: Ukraine data from MOH (2022); EU countries' data (2020–2021) from JDC, and from NHWA for countries with no data in JDC

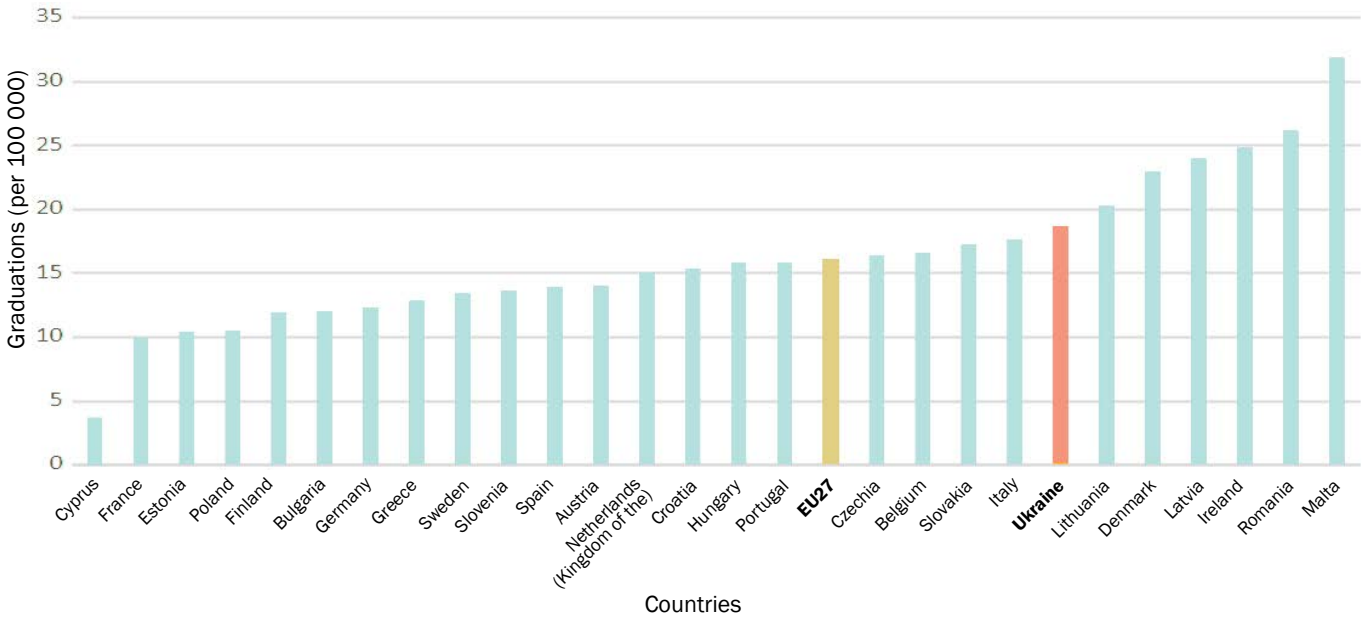
Apart from physiotherapists, Ukraine also has a cadre of occupational therapists. The density of occupational therapists in Ukraine was 0.4 per 10 000 population (September 2023). There is also a professional category of doctor of physical/rehabilitation medicine and their density in Ukraine was 0.5 per 10 000 population (NHSU, September 2023). The density of physiotherapists and occupational therapists in Ukraine reported above may be an underestimate. The data captured by the NHSU portal might be incomplete as it started collecting this data very recently. Secondly, many of the physiotherapists or other rehabilitation health workers may be practicing informally and may not be intending to register with the NHSU. Thus, the actual density of physiotherapists and occupational therapists may be a few times greater than reported above. But even if we assume the actual density to be three times greater, it will still be less than one fourth of the EU countries' average. Currently, due to the impact of the war, Ukraine is facing an increased need for rehabilitation health-care services. The shortage of physiotherapists is therefore even more acute in relation to the population's health need.

1.6 Comparison of health worker production in Ukraine and the EU

Medical graduates and entrants

The number of Ukrainian medical graduates produced in 2023 was greater than the average figure for EU countries in 2020 (Fig. 10).

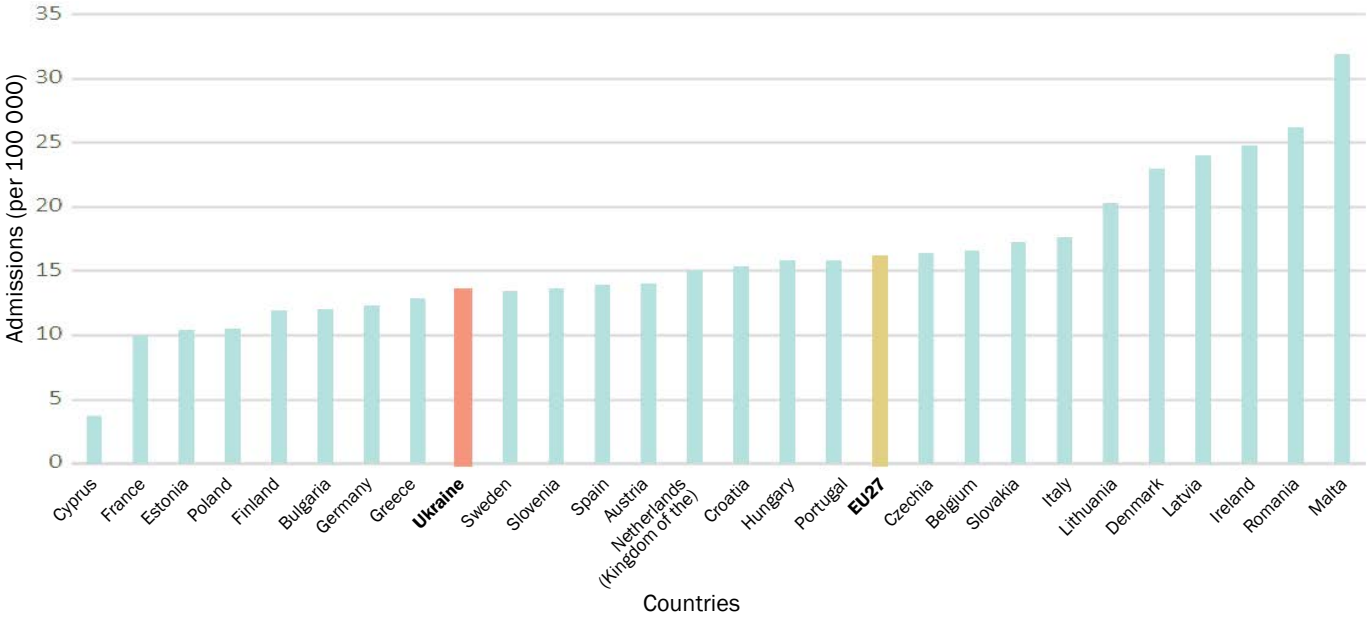
Fig. 10. Annual Ukrainian medical graduates per 100 000 population – comparison with EU



Source: Ukrainian data from MoH (2023); EU countries' data (2020) from JDC/NHWA

The number of admissions to medical schools declined sharply in 2022 and 2023. The number of Ukrainian medical entrants per 100 000 population was 13 in 2023 compared to the EU average of 16 per 100 000 medical graduates (Fig. 11).

Fig. 11. Annual admissions of Ukrainian medical students per 100 000 population medical graduates in EU countries

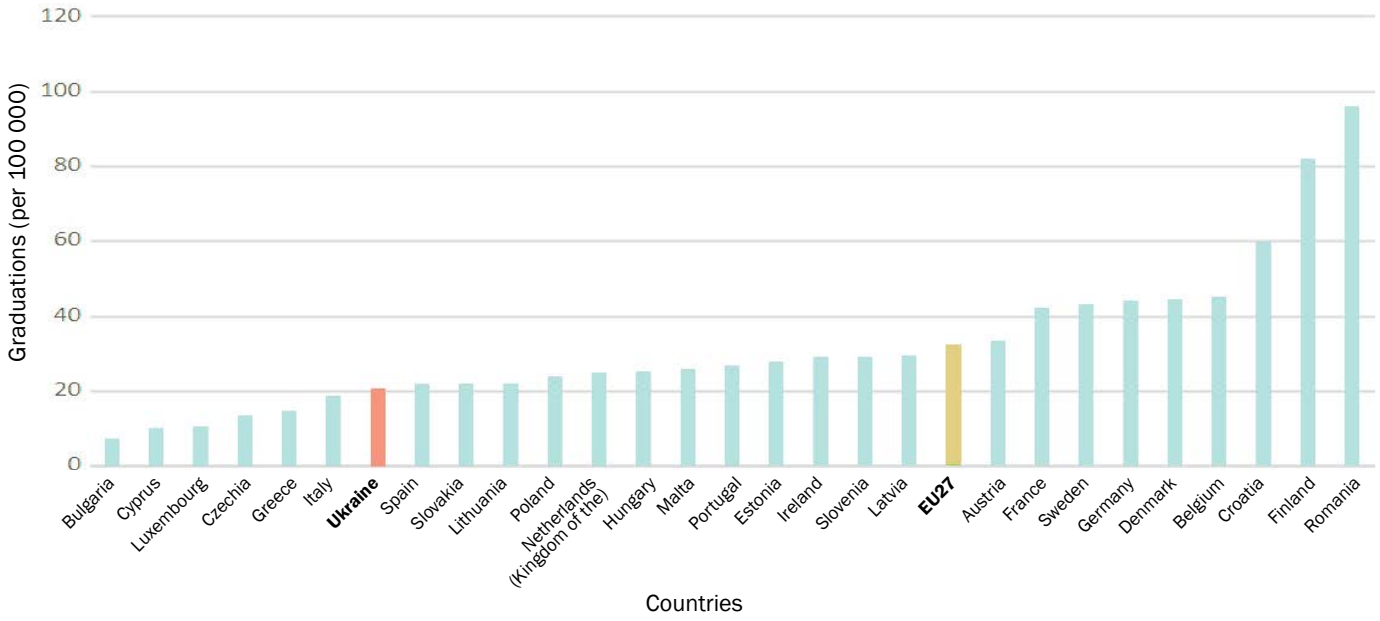


Source: Ukrainian data from MoH (2023); EU countries' data (2020) from JDC/NHWA

Nursing graduates and entrants

The nurse graduates in Ukraine in 2023 were around 20 per 100 000 population, which was around 37% lower than the average of EU countries (32 per 100 000 in 2020) (Fig. 12).

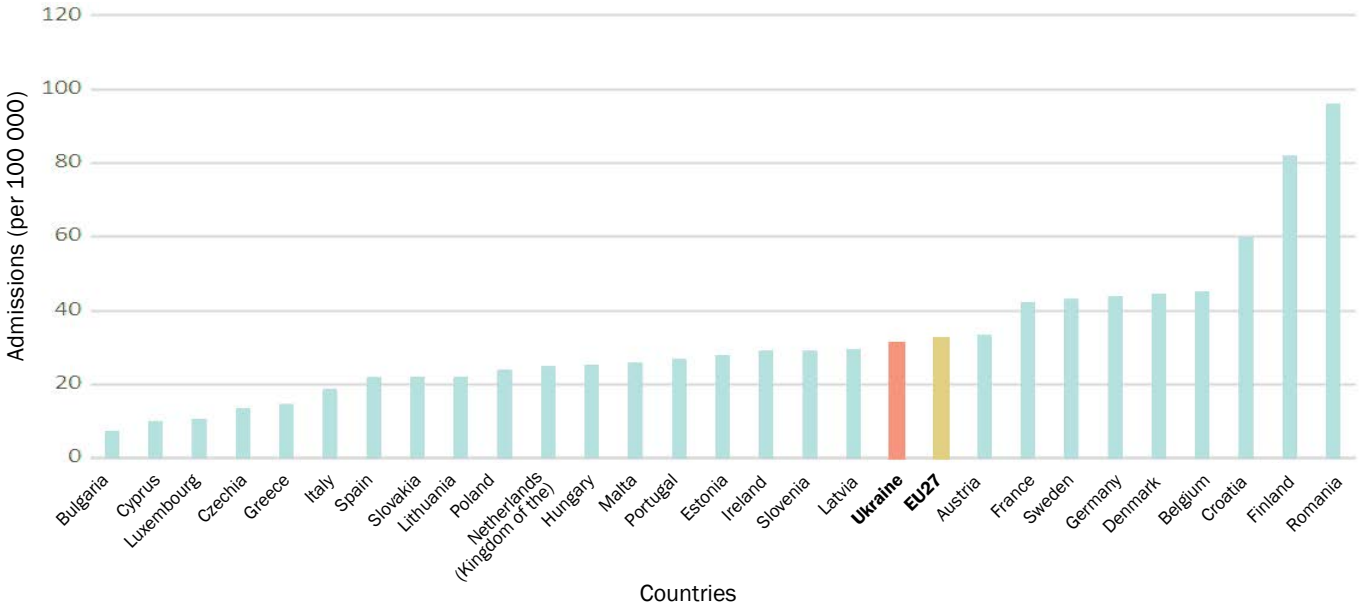
Fig. 12. Annual Ukrainian nursing graduates per 100 000 population – comparison with EU



Source: Ukrainian data from MoH (2023); EU countries' data (2020) from JDC/NHWA

According to the data collected by the MoH, the number of admissions into nursing has been increasing in Ukraine. In 2023, the number of Ukrainian entrants into the nursing curriculum per 100 000 population was similar to the EU average (Fig. 13). Unlike medical students, nursing students are mostly Ukrainian and very few are international students.

Fig. 13. Annual admissions of Ukrainian nursing students per 100 000 population – comparison with nursing graduates in EU countries



Source: Ukrainian data from MoH (2023); EU countries' data (2020) from JDC/NHWA

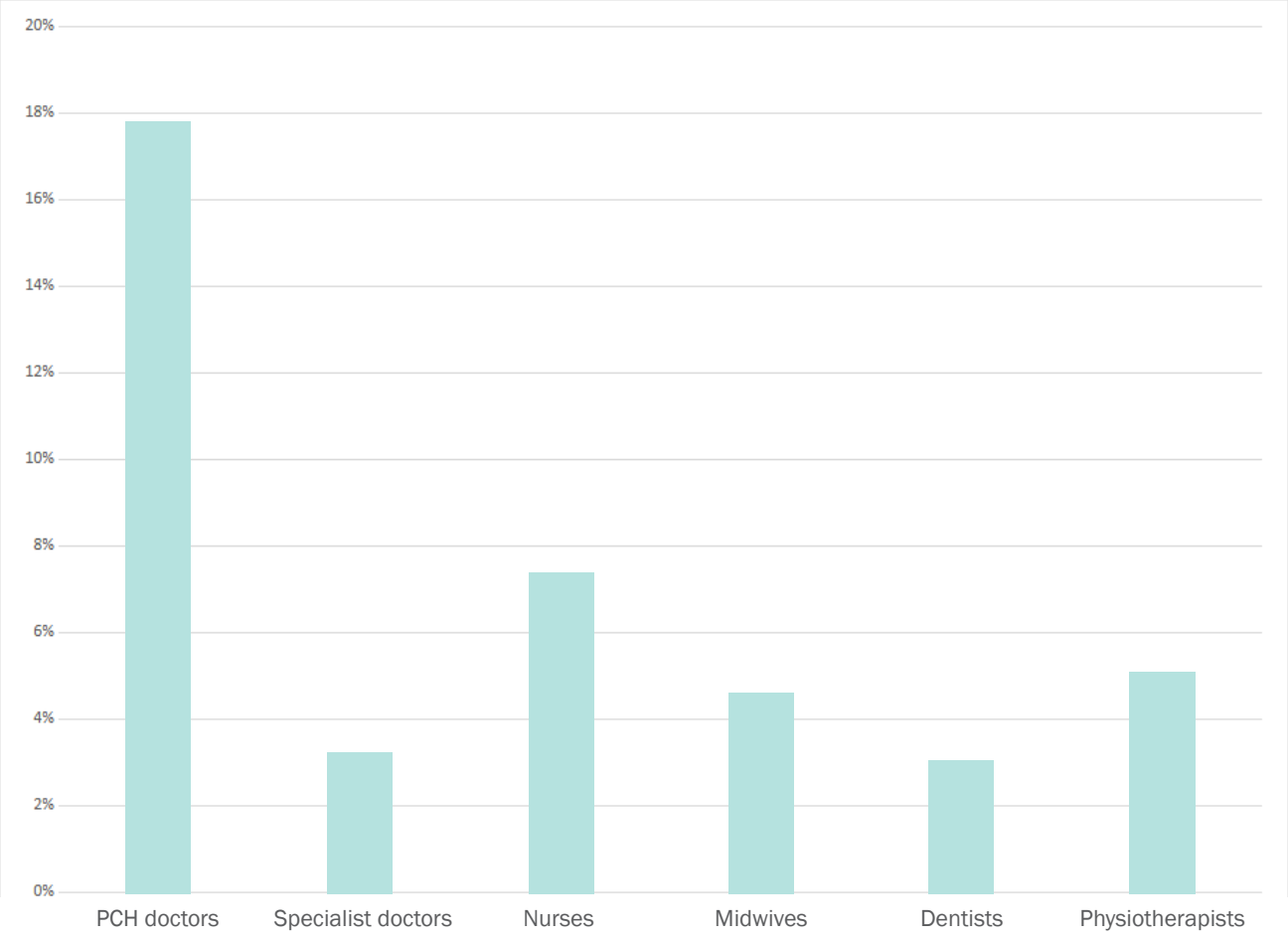
2. What is the situation of health workforce availability and distribution in Ukraine?

2.1 Geographical distribution of existing health workforce

Rural-urban distribution

The proportion of health workers working in rural areas in Ukraine is given in Fig. 14. It shows that a very small part of the health workforce is deployed in rural areas. 30% of the population of Ukraine lives in rural areas but only 17% of PHC doctors and 7% of all nurses are working in rural areas.

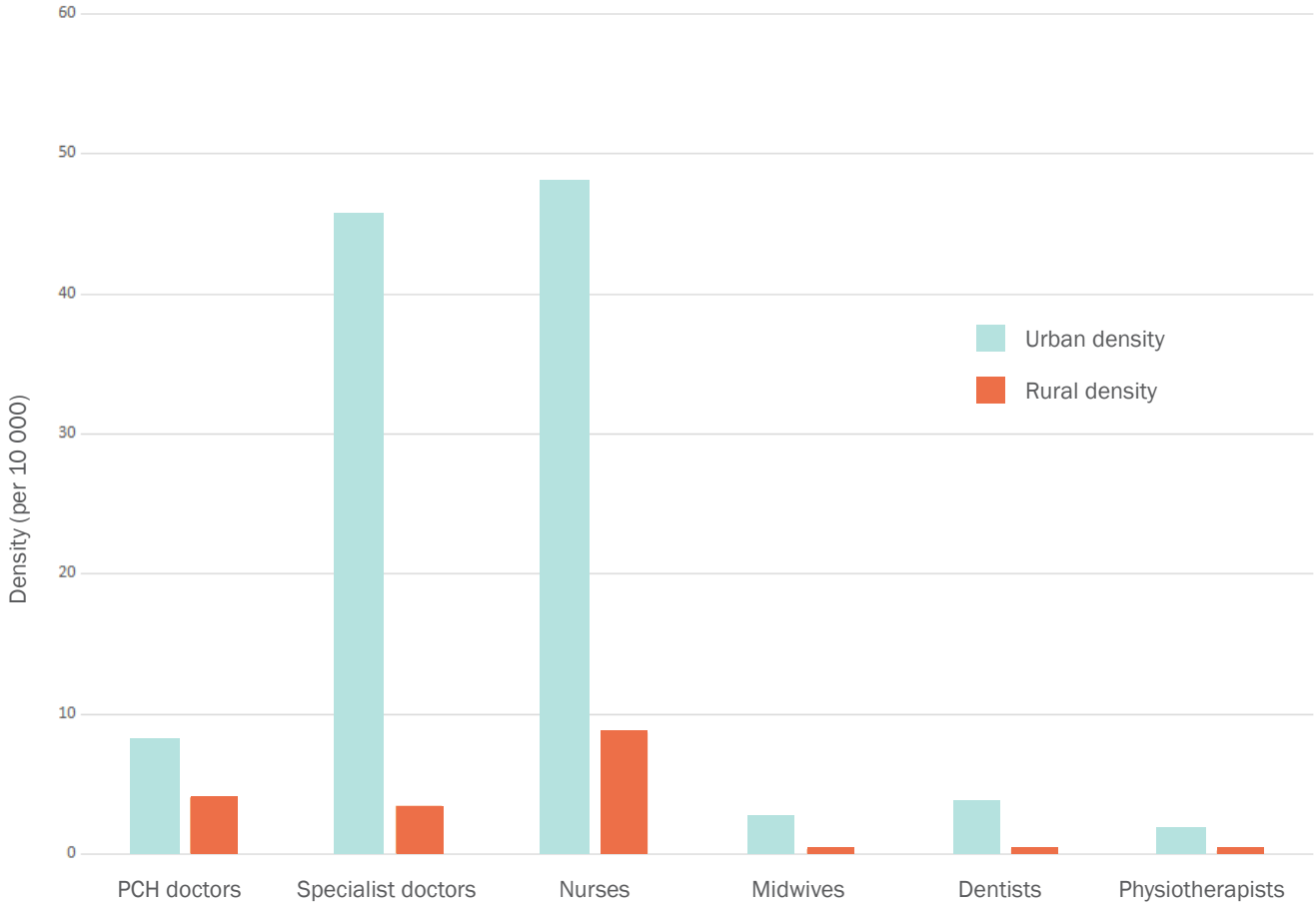
Fig. 14. Proportion of health workers deployed in rural population (September 2023)



Source: NHSU data (September 2023)

A comparison of the density of health workers in rural and urban populations shows that the density of PHC doctors in rural areas is half compared to that in urban areas (Fig. 15). The density of specialist doctors in rural areas is 13 times lower than in urban areas. The density of nurses in rural areas is six times lower than in urban areas. The density of midwives in rural areas is nine times lower than that in urban areas. The density of dentists in rural areas is 12 times lower than in urban areas. The density of physiotherapists in rural areas is nine times lower than in urban areas.

Fig. 15. Density of health workers per 10 000 in urban and rural populations of Ukraine (September 2023)

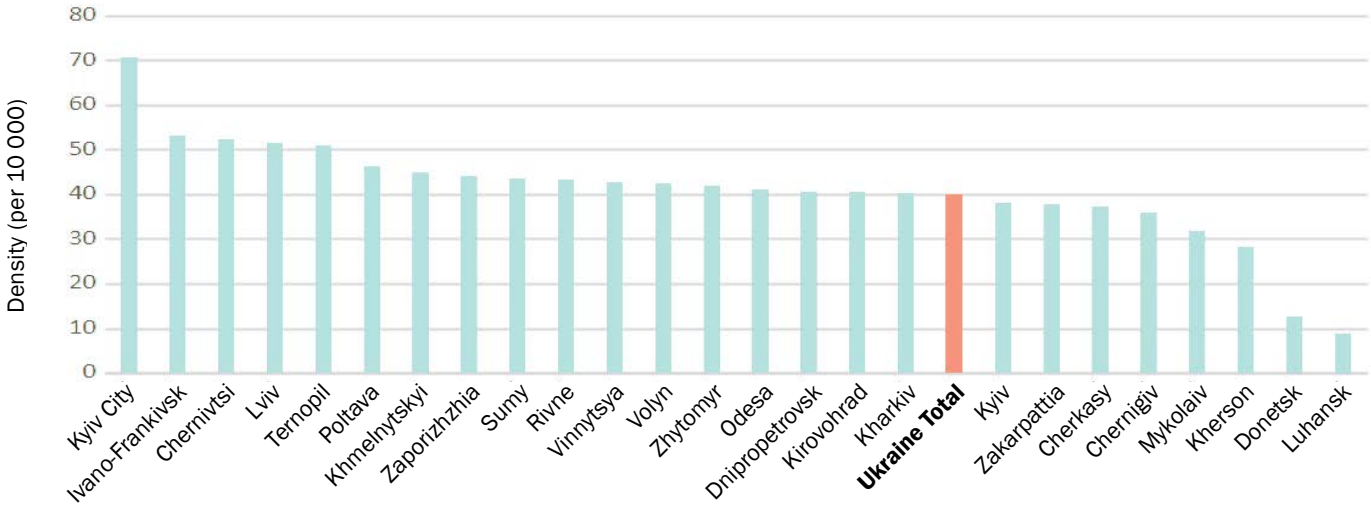


Source: NHSU data (September 2023)

Distribution of health workforce across oblasts

There is some variation in the density of medical doctors across oblasts (Fig. 16). For example, the density of doctors in Mykolaiv is half of that in Kyiv city.

Fig. 16. Density of medical doctors per 10 000 in oblasts of Ukraine (September 2023)



According to the Law of Ukraine "On administrative and territorial order of Ukraine", article 9, there are two cities in Ukraine which have special status – Kyiv and Sevastopol, which have state administrations as executive administrations, which are equal to all oblasts` administrations, that is why the data is described separately for the mentioned cities.

Source: NHSU data (September 2023)

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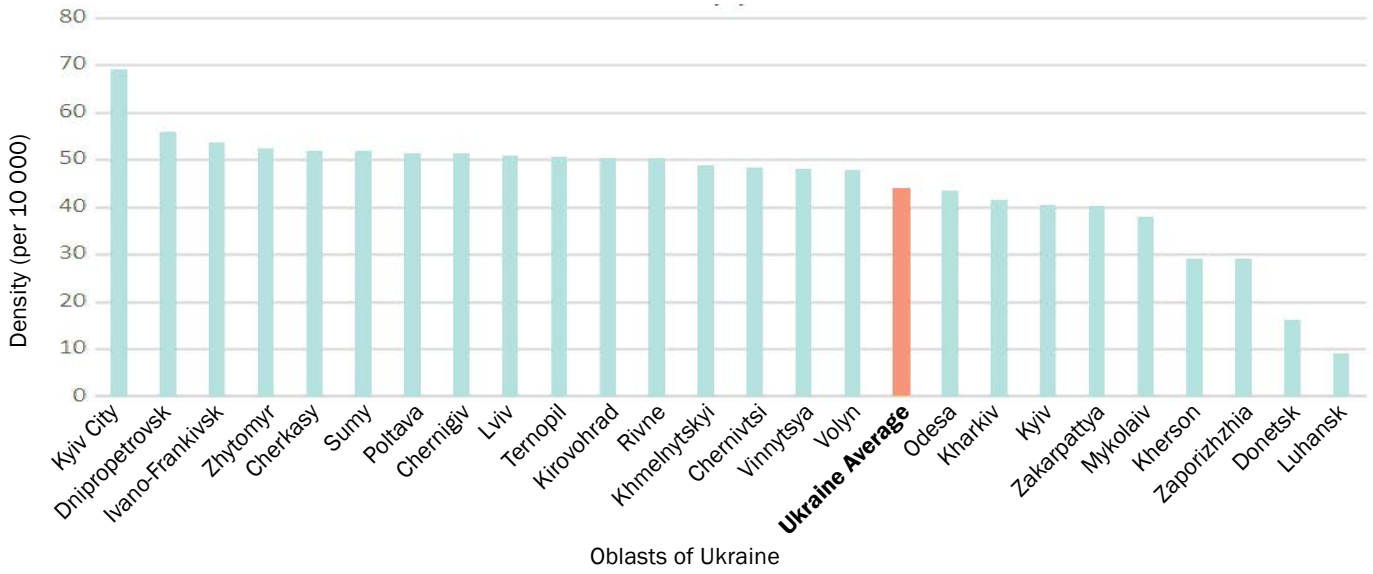
The density of nurses also varies across oblasts (Fig. 17). For example, the nurse density in Mykolaiv oblast is around 40% lower than that in Kyiv city.

Fig. 17. Density of nurses per 10 000 in oblasts of Ukraine (2022)

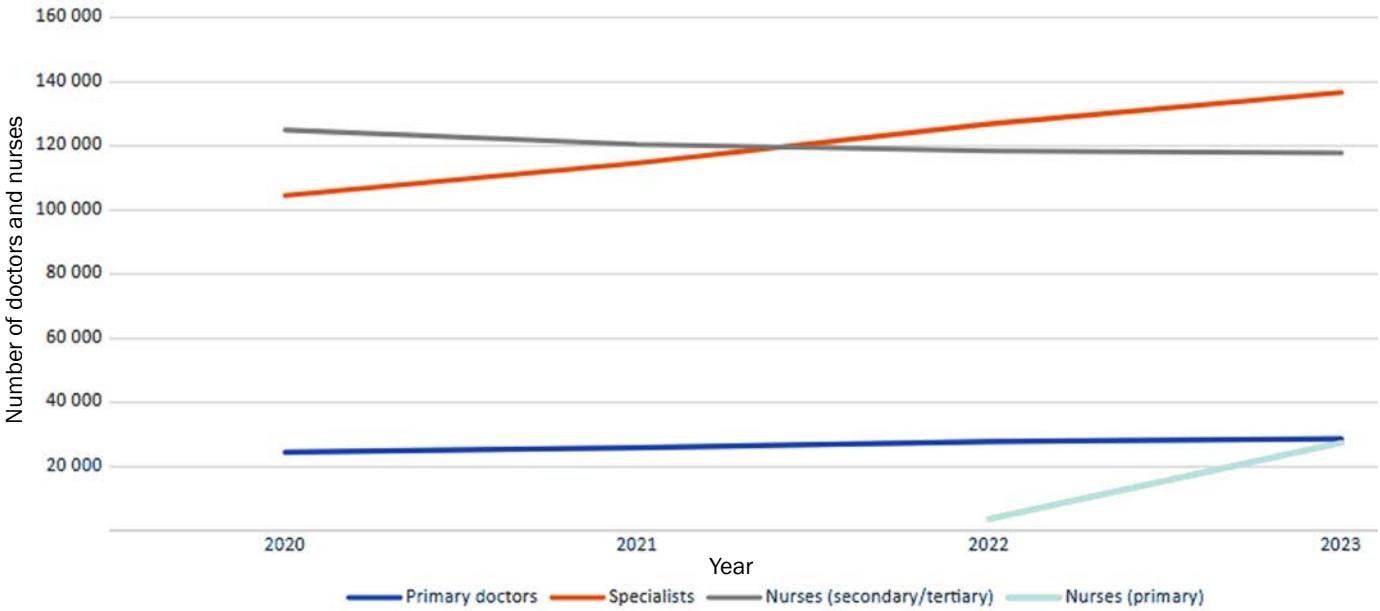


Source: MoH data (2022)

2.2 Attrition in health workforce

According to the data on health workers registered with the NHSU, the number of specialist doctors and PHC doctors in Ukraine increased from 2020 to 2023 (Fig. 18). However, it is difficult to interpret this as an increase in the availability of doctors because the NHSU register is still being populated.

Fig. 18. Trend in number of doctors and nurses from 2020 to 2023 registered with NHSU

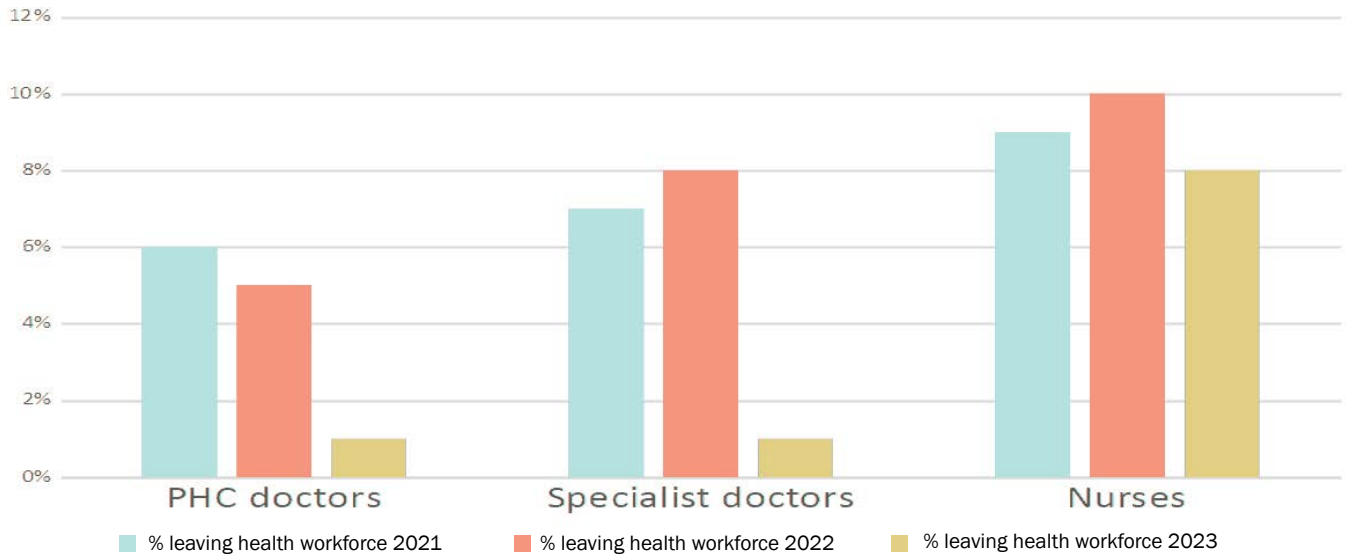


Source: MoH data (2022)

The NHSU started capturing the data on nurses working at the primary care level in 2022 and, expectedly, the number showed a sharp increase in 2023 because of increasing registrations of existing nurses. The bulk of nurses in Ukraine work at the secondary/tertiary levels of care and their numbers show a decline in the NHSU database from 2020 to 2023. This decline is around 5.6% over 3 years (around 7000 nurses). However, the actual decline may be larger because the number of health workers in the NHSU database is expected to rise as more of the existing health workers register with the NHSU.

Fig. 19 shows the number of PHC doctors, specialist doctors and nurses who left the workforce, according to the NHSU database.

Fig. 19. Proportion of doctors and nurses who left the workforce (NHSU)

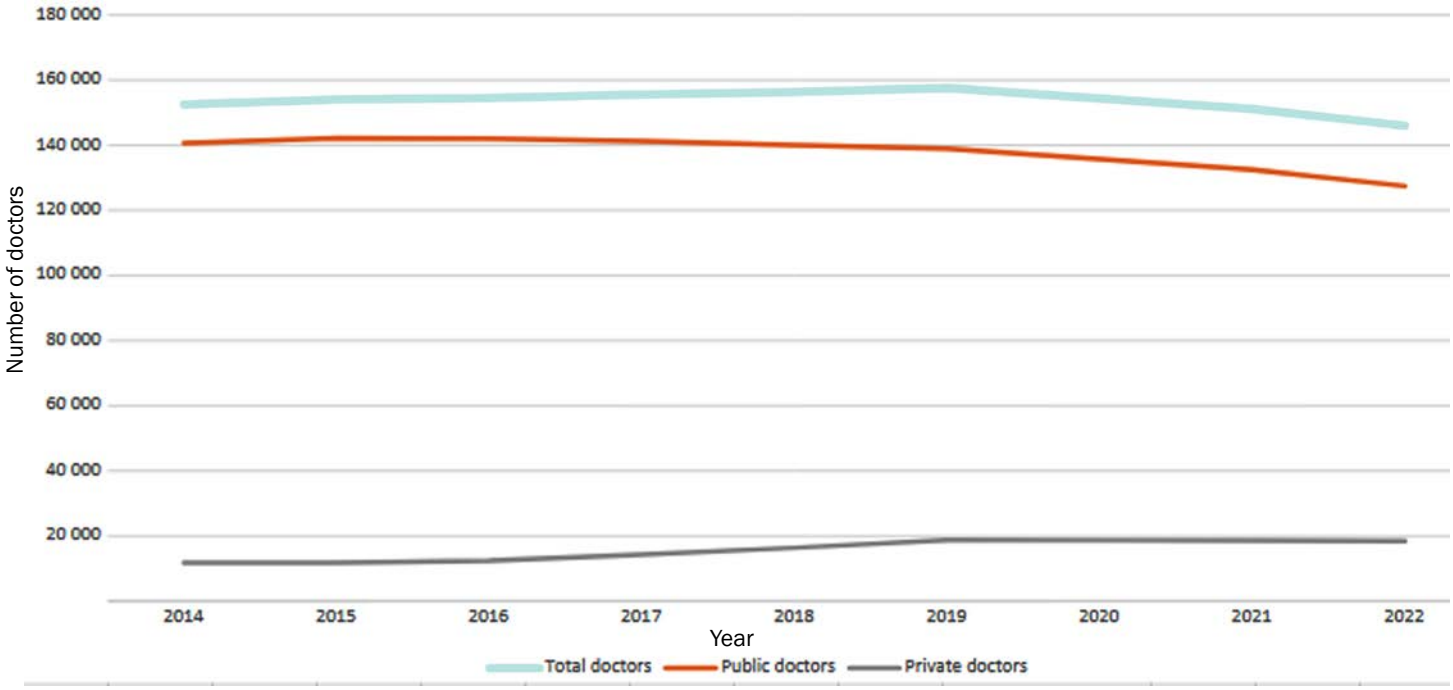


Source: NHSU data (September 2023)

As shown in Fig. 19, annually around 6% of all medical doctors were leaving the workforce in 2021 and 2022 (attrition in other countries is usually around 4%). The attrition among specialist doctors was greater than that of PHC doctors (8% vs 5% in 2022). But the attrition among all doctors slowed down in the first nine months of 2023 to around 1%.

The data from the bulletins of the Public Health Centre provides a long-term trend in the number of doctors (Fig. 20). It shows a steady increase in the overall number of doctors between 2014 and 2019 but a sharp decline from 2019 to 2022. In the period 2014 to 2019, the number of public sector doctors grew very slowly, and the main increase was in the private sector. But from 2019 to 2022, while doctors in the private sector continue to increase, there was a substantial decline in the number of public doctors. This indicates the adverse impact of the COVID-19 pandemic. The decline continued in 2022, which indicates the impact of the war, although the data used here has limitations in capturing the full extent of the impact.

Fig. 20. Long-term trend in number of doctors in Ukraine



Source: Data from Public Health Centre of MoH Ukraine

Table 2 indicates that the decline became faster after the war started.

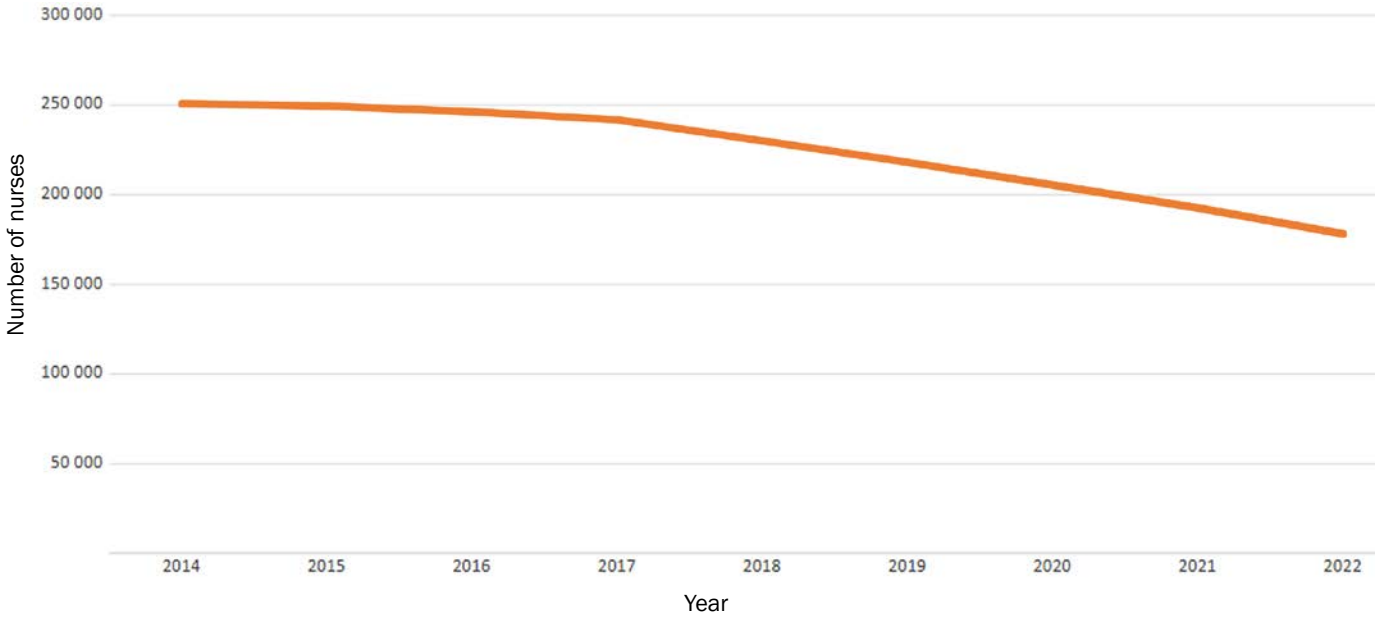
Table 2: Rate of change in number of doctors in Ukraine

Period	Change	Average annual change
2014–2019	3.4%	0.7%
2019–2021	-4.2%	-2.1%
2021–2022	-3.4%	-3.4%

Source: Data from Public Health Centre of MoH Ukraine

The data from the bulletins of the Public Health Centre also provides a long-term trend in the number of nurses (Fig. 21). It shows a slow decline in the number of nurses between 2014 to 2017 but a sharp decline from 2017 to 2022. This indicates that the decline in the public deployment of nurses started well before the COVID-19 pandemic and was exacerbated further with the impact of COVID-19, followed by the impact of the war. The actual decline due to the war is likely to be even greater.

Fig. 21. Long-term trend in number of nurses in Ukraine



Source: Data from Public Health Centre of MoH Ukraine

The average annual rate of decline in deployed nurses has become a bigger threat after the war (Table 3).

Table 3. Rate of change in number of nurses in Ukraine

Period	Change	Average annual change
2014–2019	-13.0%	-2.6%
2019–2021	-11.7%	-5.8%
2021–2022	-7.5%	-7.5%

Source: Data from Public Health Centre of MoH Ukraine

The attrition among nurses was greater than among doctors. The attrition in nurses continued to be high in 2023 (up to September). Annually around 11 000 (10%) nurses left the health workforce from 2021 to 2023.

Table 4 shows the decline in the number of different cadres of health workers from 2020 to 2022 according to the data collected by MoH.

Table 4. Decline in number of health workers in Ukraine from 2020 to 2022

Cadre	Decline in number of personnel from 2020 to 2022	Decline % from 2020 to 2022
PHC doctors	310	2.1%
Specialist doctors	2529	2.4%
Nurses	24 377	11.8%
Midwives	1711	16.5%
Dentist	5263	28.8%
Laboratory technicians	3029	16.3%
X-ray technicians	824	11.0%

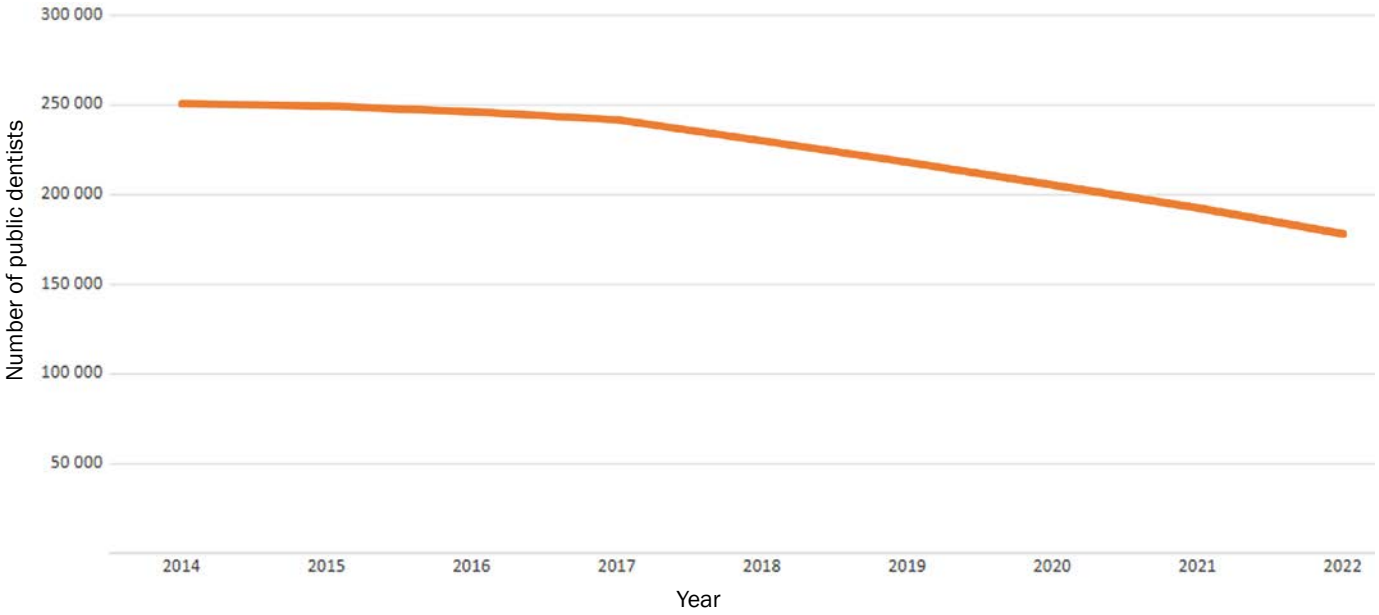
Source: Data from Public Health Centre of MoH Ukraine

The significant decline in the number of nurses is confirmed by the data collected by the MoH from the oblasts. According to MoH data, there was an 11.8% decline in the number of nurses from 2020 to 2022. In two years, the number of nurses declined by around 24 000 nurses. The annual decline of around 12 000, according to MoH data, roughly matches the annual decline of 11 000 nurses, according to NHSU data.

According to Table 4, the MoH data shows a decline of 16.5% in the number of midwives and a 28.8% decline in the number of dentists.

The data from the bulletins of the Public Health Centre provides a long-term trend in the number of dentists (Fig. 22). It tells a story similar to that of nurses. The decline was slow in the 2014 to 2017 period. The decline became sharp thereafter, indicating that the public deployment of dentists was falling sharply also before the COVID-19 pandemic.

Fig. 22. Long-term trend in number of public dentists in Ukraine



Source: Data from Public Health Centre of MoH Ukraine

Table 5 shows that the rate of decline in public dentists increased after 2019.

Table 5. Rate of change in number of public dentists in Ukraine

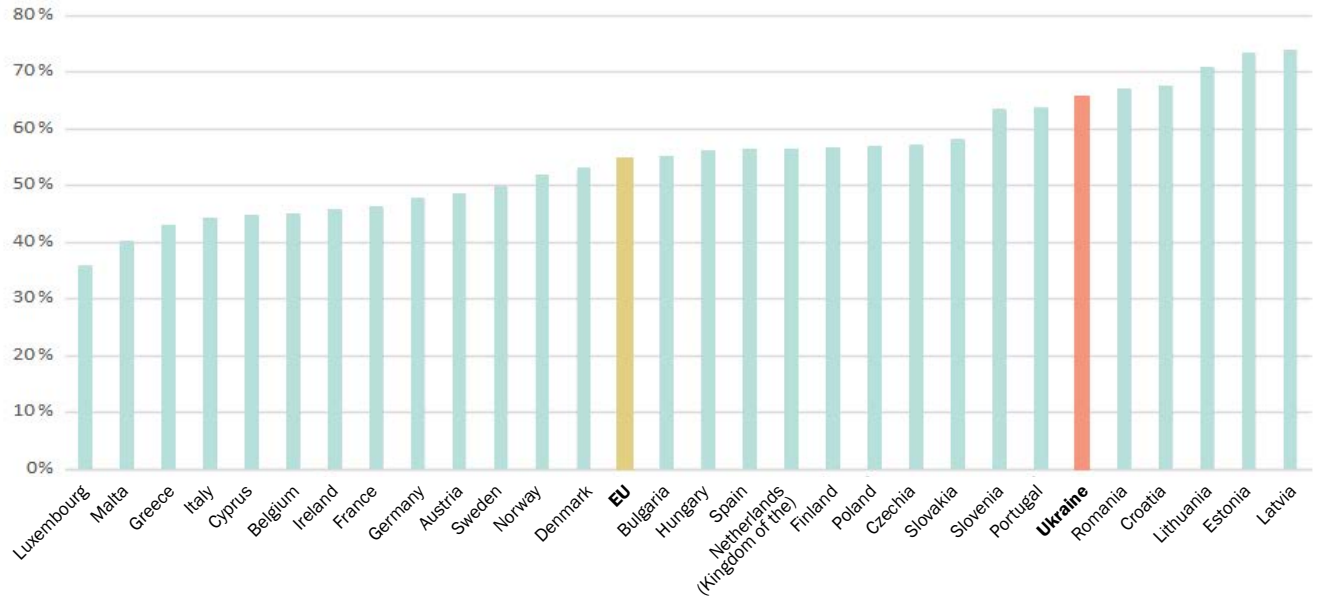
Period	Change	Average annual change
2014–2019	-20.5%	-4.1%
2019–2021	-25.9%	-13.0%
2021– 2022	-11.4%	-11.4%

Source: Data from Public Health Centre of MoH Ukraine

The high rates of attrition could be related to aging of the health workers. According to a WHO report on PHC, as many as 53% of the PHC doctors were above the age of 50 years *(13).* Among PHC doctors, 29% were above the age of 60 years (13). According to the kadry bulletins of the Public Health Centre, around a quarter of all doctors (family doctors and specialists) in the country were of retirement age. This indicates an aging health workforce and real threat of high attrition in the near term. It also indicates that public sector absorption (recruitments) of health workers in Ukraine has been low in recent decades.

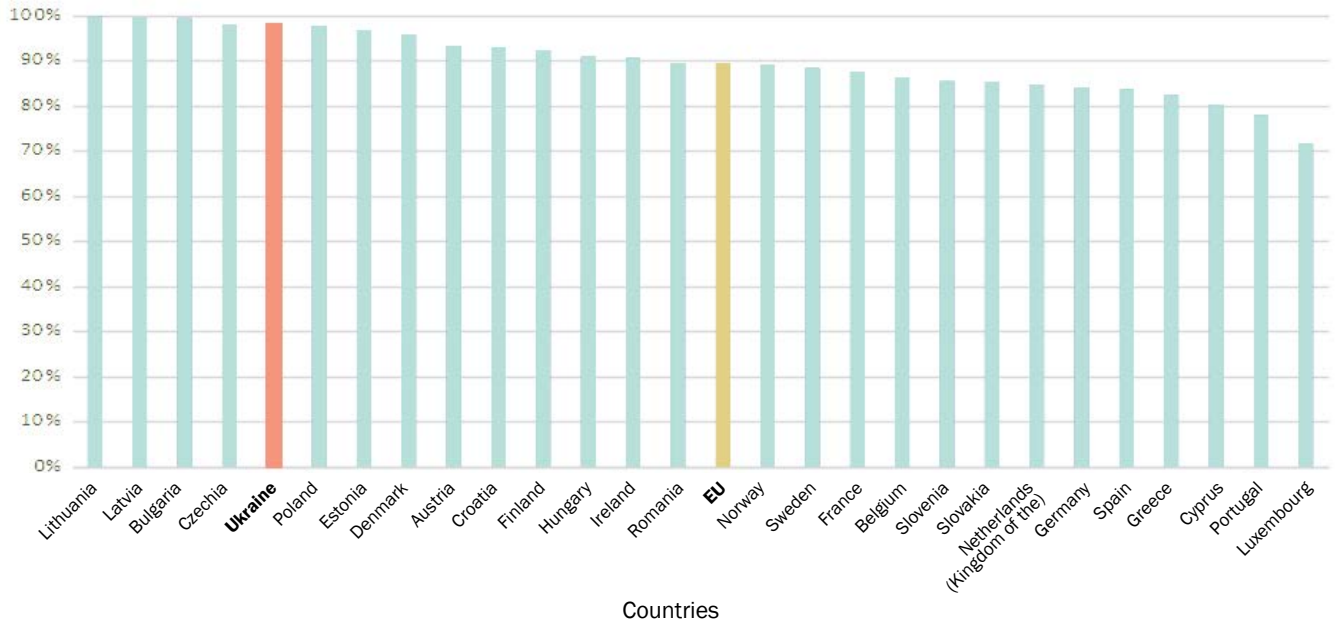
The attrition of health workers in the last two years could also be related to the war in Ukraine. The war has caused a large displacement of the population as well as health workers. There is also a possibility that many health workers have migrated to other countries in these years, and this may also be related to the gender profile of the health workers in Ukraine. While government rules prohibited men to leave the country, female health workers might have emigrated in large numbers due to the war. The proportion of female doctors and nurses is shown in Fig. 23 and Fig. 24, respectively.

Fig. 23. Proportion of female medical doctors – in Ukraine and EU countries



Source: NHSU data (September 2023)

Fig. 24. Proportion of female nurses – in Ukraine and EU countries



Source: NHSU data (September 2023)

The health workforce in Ukraine is highly feminized. As compared to the average of 46% of doctors being female in EU countries, 65% of doctors in Ukraine are female. Female proportions for other cadres in Ukraine are:

- 62% of specialist doctors
- 81% of PHC doctors
- 98% of nurses
- 61% of physiotherapists
- 71% of occupational therapists
- 57% of dentists

2.3 Remuneration and retention

The national remuneration norm for doctors is 20 000 Ukrainian hryvnia (hrv) per month; for nurses it is 13 500 hrv per month from 2022 onwards *(14)*. An assessment of how this remuneration compares with the average wage in the country is needed. There is some flexibility in salaries at the facility level as hospital directors can pay some staff above the norm, by around 30%. According to a costing study by WHO in 2023, the median salary of nurses of 10 334 hrv per month (in 2021) was below the current norm (2022) of 13 500 hrv *(14)*. PHC doctors having more declarations can earn more than their norm, but their median salary of 20 366 hrv per month (in 2021) was found to be very close to the current (2022) norm of 20 000 hrv *(14)*. There are no policies to pay financial incentives for working in rural or remote areas, except in the mountainous areas.

The current remuneration is not seen as attractive, and many doctors and nurses are preferring to migrate abroad. This could also be a factor that affects the return of health professionals to Ukraine among those who migrated due to the war. There are many nurses who work within Ukraine, but in non-health occupations, such as cosmetic care work. From 2016 onwards, Ukraine implemented reforms that allowed greater autonomy to health facilities; for example, the facilities decide whether they want to hire more staff or not. However, many facilities are unable to hire due to financial constraints. Thus, the demand for recruitment is not high from the facilities side and many qualified health workers prefer jobs with better remuneration.

At the PHC level, financing policies link funding to the number of patients choosing one of the doctors employed at the facility (declarations). There is an incentive to employ more doctors because this can result in more declarations and therefore more payments to a PHC facility. However, there is no increase in payments received if a facility employs more nurses. Thus, there is little incentive for PHC facilities to recruit nurses. In 2024, the NHSU made it mandatory for a PHC facility to have a nurse.

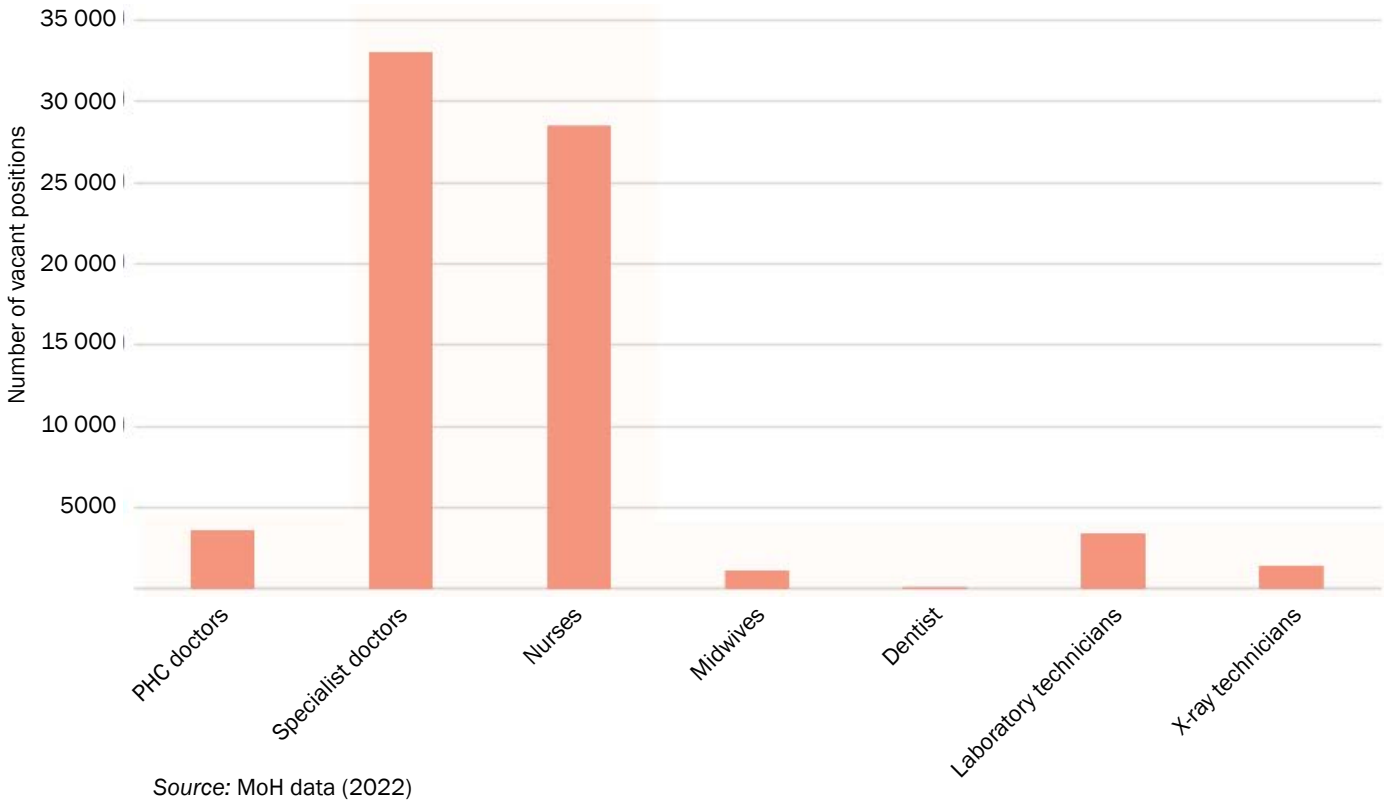
There are limited career advancement opportunities for occupations other than medical doctors. Nurses in particular face a high workload, low remuneration, and limited career advancement. A recent study by WHO on the time use of the PHC workforce in Ukraine showed that nurses had to spend a significant part of time on non-clinical tasks, such as entering data *(15)*.

There is evidence of increased emigration of doctors, nurses and other health professionals from Ukraine since the conflict started *(16)*. Countries receiving the refugee population and health workers had to facilitate accessible pathways for the Ukrainian health workers to be able to practice *(16)*. It has become more difficult for Ukrainian health facilities to attract and retain health workers.

2.4 Vacant positions

Fig. 25 shows the number of vacant positions for different cadres in the public sector in 2022 (MoH data).

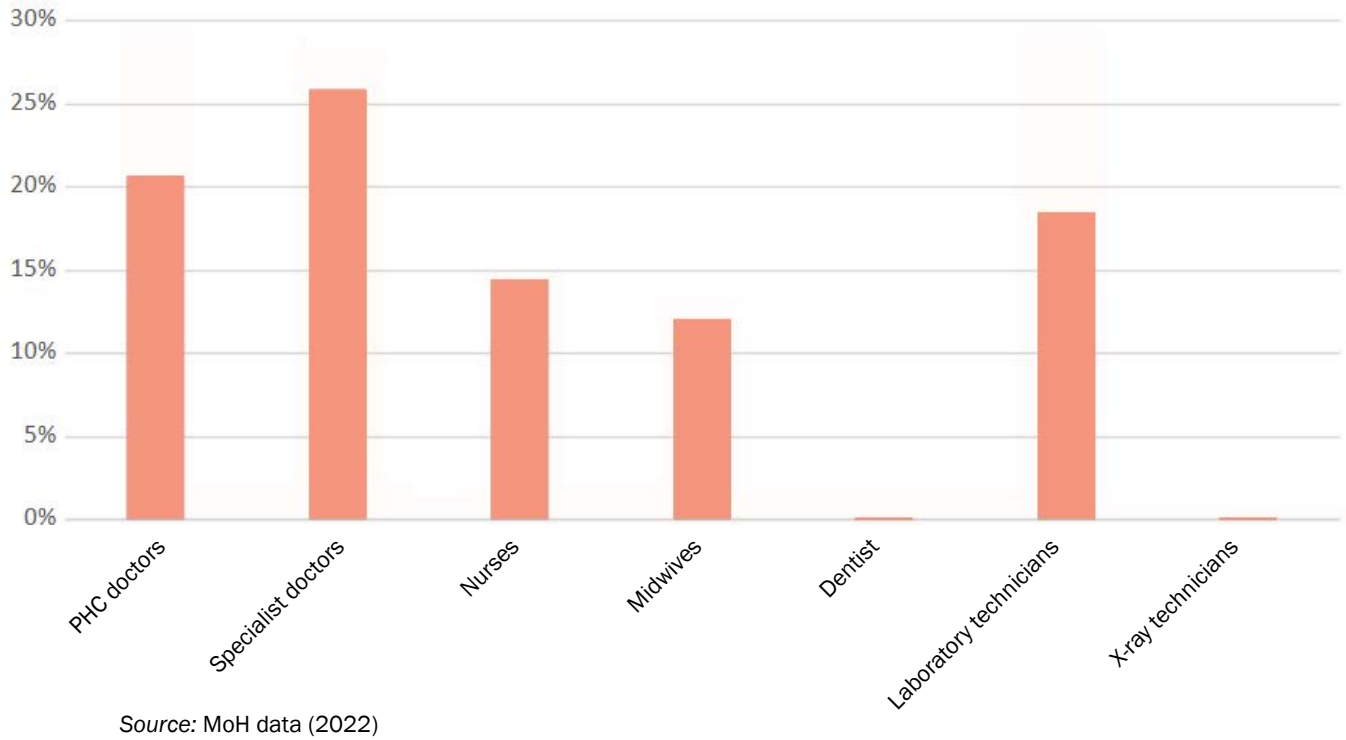
Fig. 25. Number of vacant positions for different occupations in Ukraine (2022)



Source: MoH data (2022)

Fig. 26 shows the proportion of vacant positions in relation to the number of approved positions.

Fig. 26. Proportion of vacant positions out of approved positions for different occupations in Ukraine (2022)

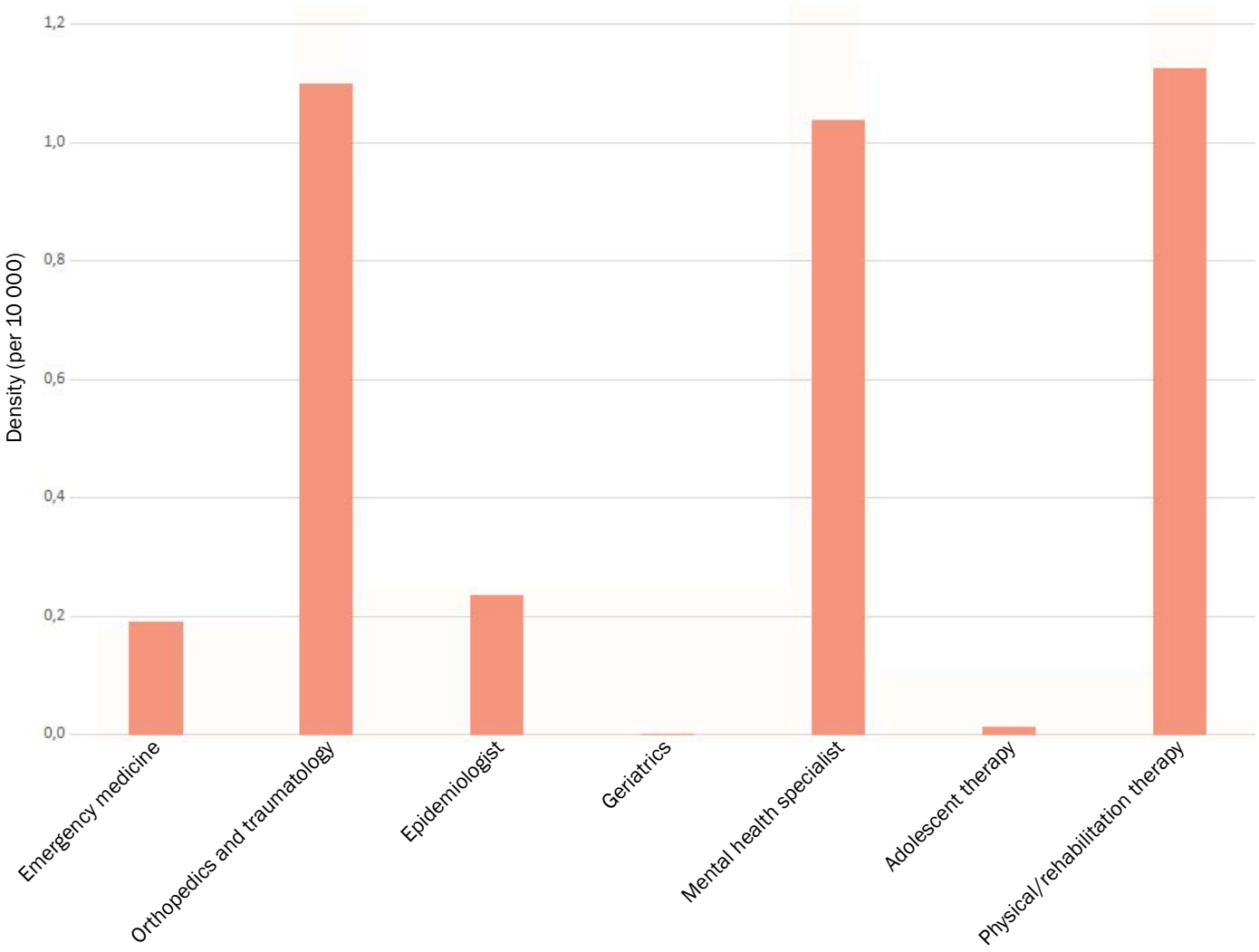


Source: MoH data (2022)

Vacancies were very high among specialist doctors (25.8%) as well as PHC doctors (20.6%) and nurses (14.4%). In terms of numbers, there was a shortage of around 35 000 doctors and 28 000 nurses. The vacancies are expected to be greater in rural areas and war-affected regions.

Fig. 27 shows the density of some types of specialist doctors. It indicates that the availability of some types of specialist doctors, such as epidemiologists, mental health specialists, geriatric care specialists and for emergency and trauma care, is low.

Fig. 27. Density (per 10 000) of selected types of specialist doctors in Ukraine (September 2023)



Source: NHSU data (September 2023)

Table 6 shows the vacancies among some of the specialist doctors. The vacancies were very high among epidemiologists (61%).

Table 6. Vacancies among selected specialist doctors

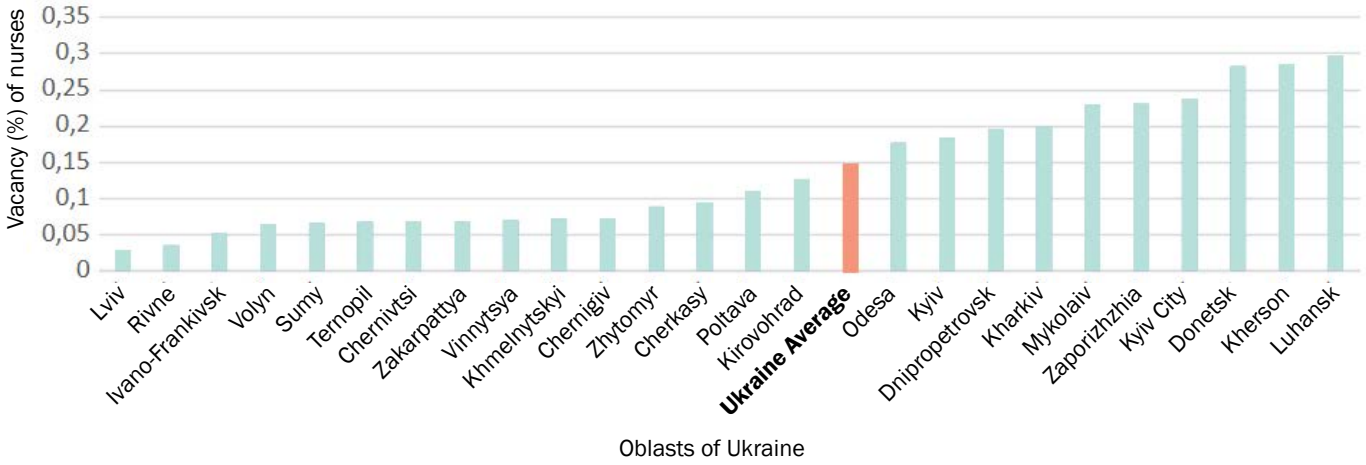
Specialization	Vacancy %
Orthopedic traumatologist	20.7%
Anaesthesiologist	30.2%
Psychiatrist	26.2%
Epidemiologist	61.5%

Source: MoH data (2022)

According to MoH officials, vacancies are high in rural areas. According to Public Health Centre bulletins, around 75% of the vacancies are concentrated in facilities that provide services mainly to the rural population.

There is a large variation in the proportion of vacancies across oblasts as indicated by the situation of nurse vacancies in 2022 (Fig. 28).

Fig. 28. Vacancy (%) of nurses in oblasts of Ukraine (2022)



Source: MoH data (2022)

Efforts have been made by the Ukrainian government to have vacancies filled by creating a web portal for applications. This has also helped internally displaced health professionals to find employment.

2.5 Health workers in the private sector

The private sector is relatively small in Ukraine but is rapidly growing, especially in urban areas. Only 14% of doctors worked in private facilities in September 2023 (NHSU data). However, the proportion of private doctors was 35% in Kyiv city (NHSU data 2023). The proportion of nurses in the private sector was 7% according to MoH data for 2022 (Table 7).

Table 7. Proportion of health workers working in private sector

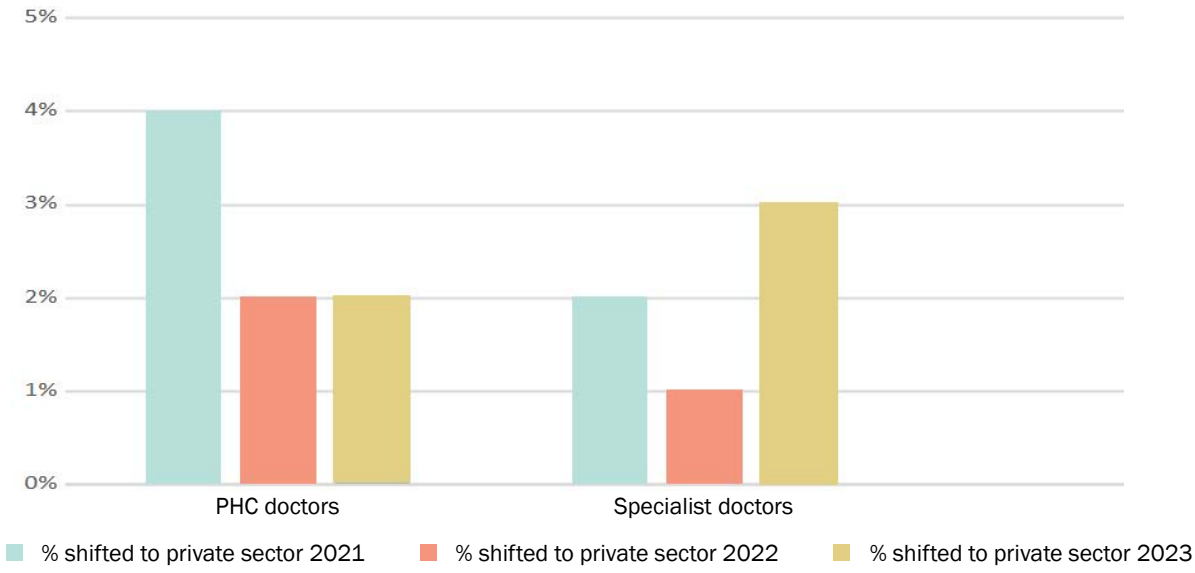
Occupation	Private sector
PHC doctors	7%
Specialist doctors	10%
Nurses	7%
Midwives	7%
Laboratory technicians	5%
X-ray technicians	9%
Dentist	43%
Physiotherapists	6%
Doctor of physical therapy	7%

Source: MoH data (2022)

According to MoH data, around 43% of dentists were in the private sector in 2022. The proportion of physiotherapists in the private sector was around 6% but the actual share is likely to be higher considering that a large proportion of physiotherapists in Ukraine work without registration.

Annually, around 2% of doctors are shifting from the public sector to the private sector (Fig. 29). At this rate, in a decade, the public sector could end up losing a significant share of its doctors.

Fig. 29. Proportion of doctors shifting annually from the public to private sector



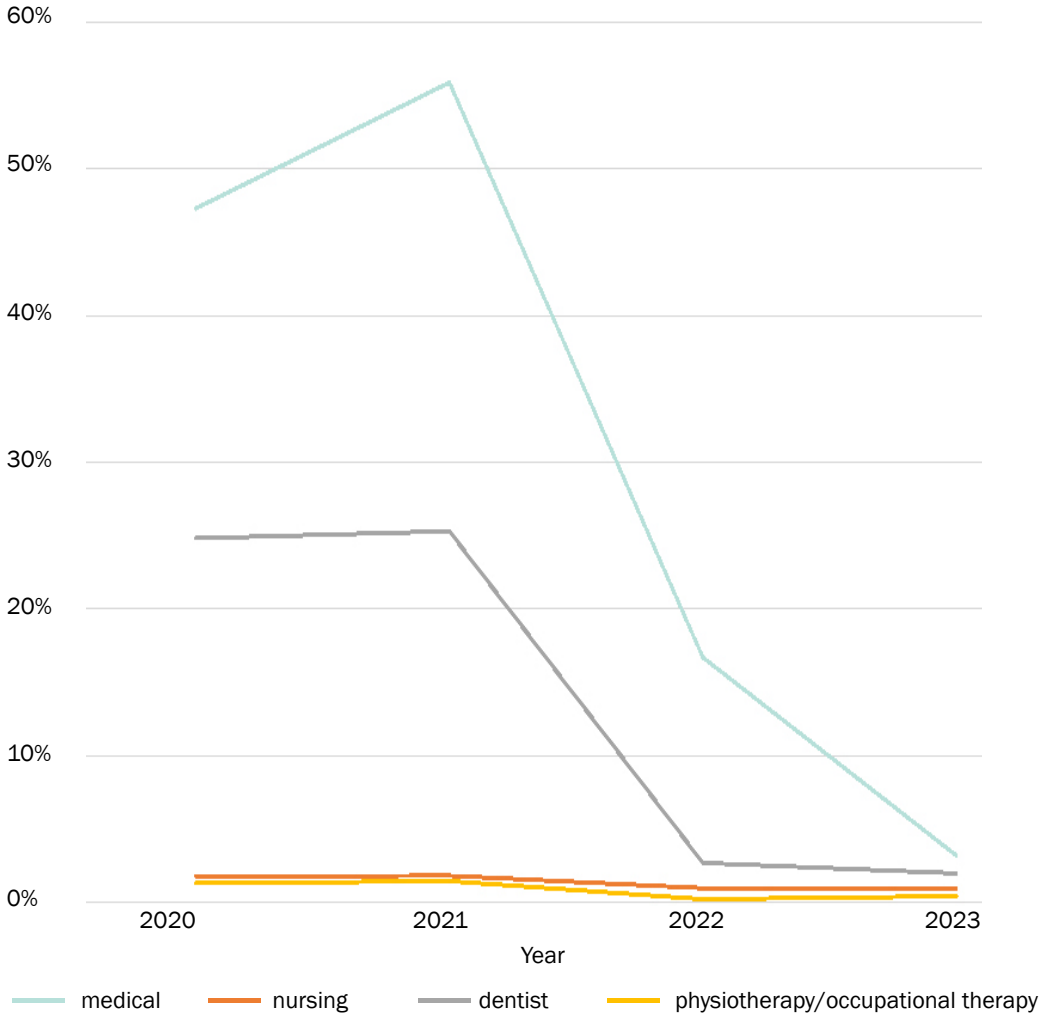
Source: NHSU data

3. Is Ukraine producing enough health workers?

3.1. Medical graduates and entrants

The number of admissions to medical schools declined sharply in 2022 and 2023. International students used to constitute a large share of total medical entrants in Ukraine's medical schools. In 2021, 57% of the total admissions in medicine were of international students. University finances depended significantly on revenue brought in from international student admissions. With the war in 2022, international admissions in medicine fell sharply. In 2023, international admissions were negligible (Fig. 30).

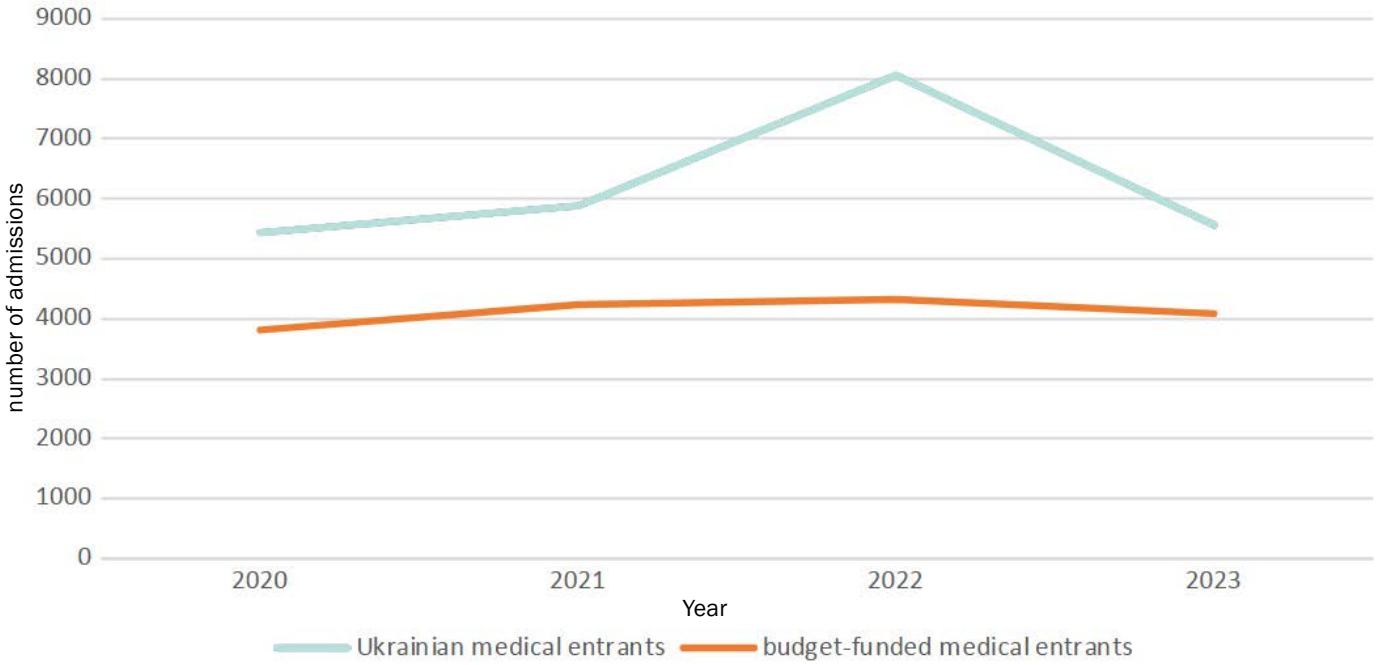
Fig. 30. Share of international student admissions in Ukraine



Source: MoH education data

According to data collected by the MoH, the number of Ukrainian students entering the medicine curriculum declined in 2023 from 2022. While the number of government budget-funded students remained close to 4000, the decline in 2023 was for self-funded entrants (Fig. 31).

Fig. 31. Recent trend in number of admissions in medical schools of Ukraine (2020–2023)

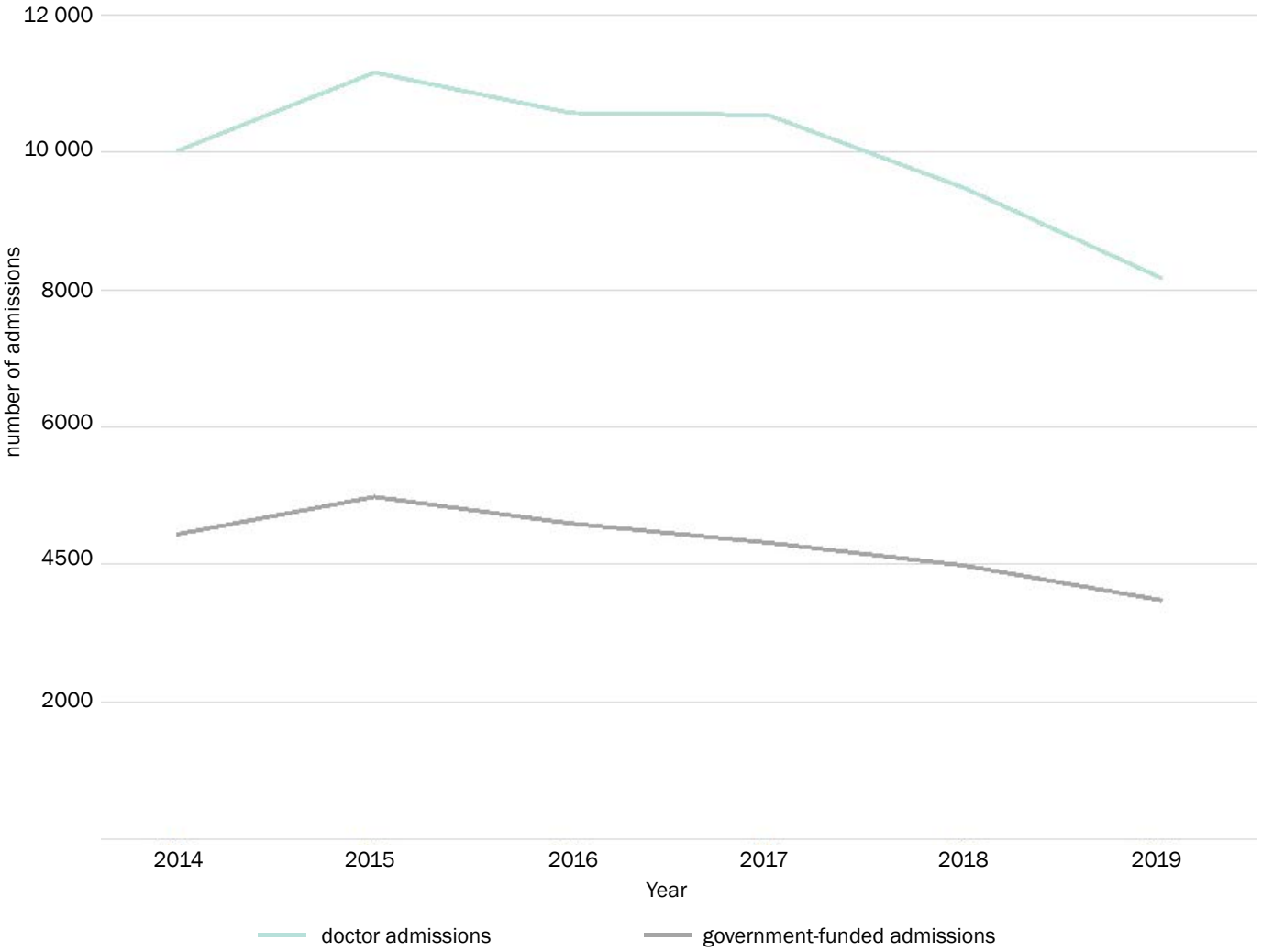


Source: MoH education data

The data available from the bulletins of the Public Health Centre provides a picture of the trend in annual production (admissions) for the medicine graduate course in Ukraine from 2014 to 2019 (Fig. 32). The trend shows that the number of admissions started declining from 2015 onwards and dropped sharply after 2017. The total annual admissions for doctors in Ukraine declined 27% from around 11 000 in 2015 to 8000 in 2019.

The number of medical entrants (doctors) funded by the Ukraine government also declined steadily, by 30% from around 5000 in 2015 to 3500 in 2019.

Fig. 32. Trend in number of admissions in medical schools of Ukraine (2014–2019)



Source: Data from Public Health Centre of MoH Ukraine

Family medicine graduates

Around 13% of graduating doctors specialize in family medicine, as per MoH data on interns. This proportion has remained stagnant in the period 2020-2023. Family medicine does not seem to be a preferred stream for the self-funded medical students as only 2% of the self-funded students were interns in family medicine. Around 13% of graduating doctors specialize in family medicine, as per MoH data on interns. This proportion has remained stagnant in the period 2020-2023. Family medicine does not seem to be a preferred stream for the self-funded medical students as only 2% of the self-funded students were interns in family medicine.

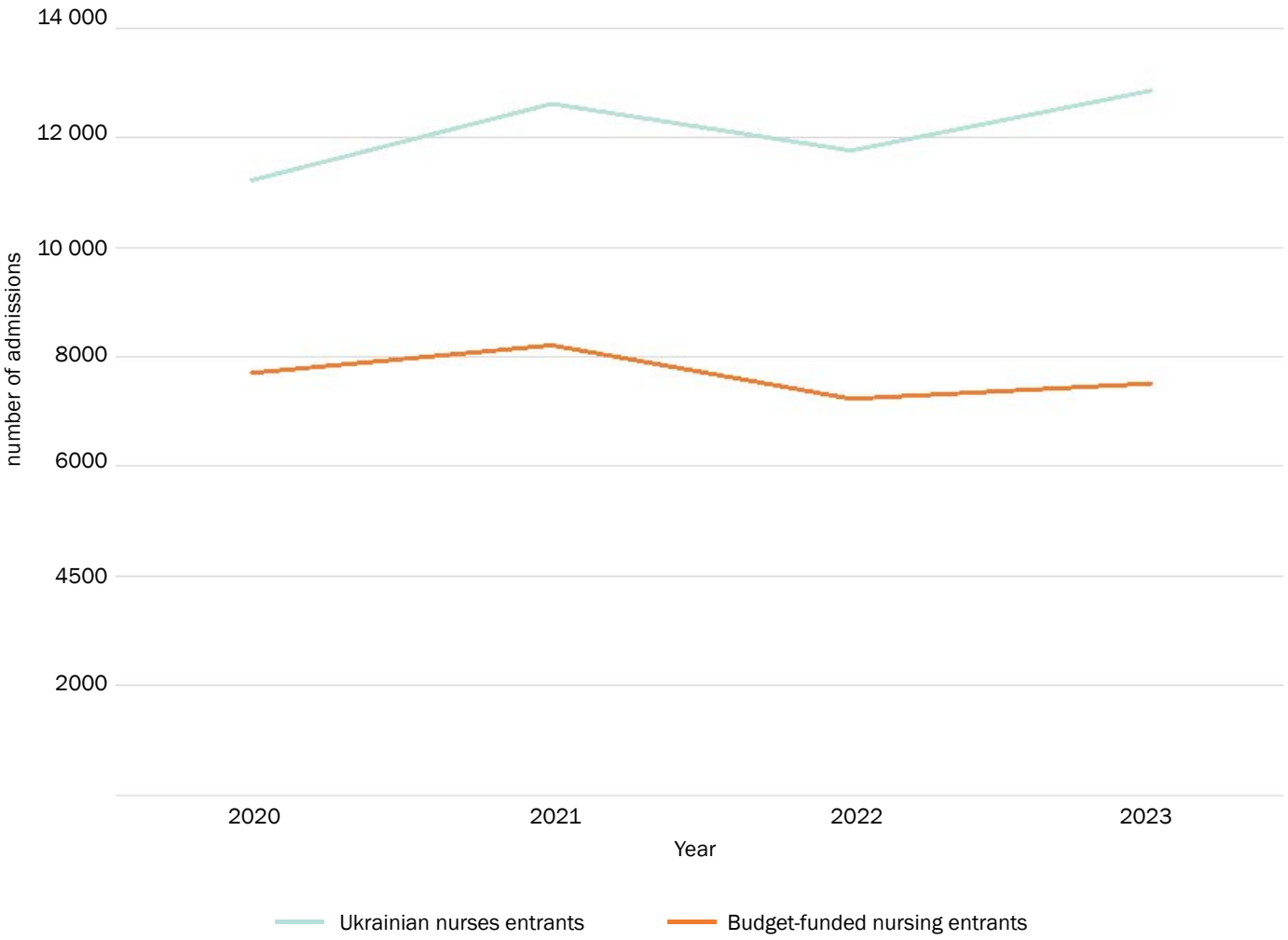
Nursing graduates and entrants

According to the data collected by the MoH, the number of admissions into nursing has been increasing in Ukraine. Unlike medical students, the students in nursing are mostly Ukrainian and there are very few international students.

According to the data collected by the MoH, the number of Ukrainian students entering the nursing curriculum increased in 2023 from 2020 (Fig. 33). The total number of nurses that will graduate annually seems similar to the annual decline of around 12 000 nurses in the workforce.

The number of government budget-funded nursing students remained stagnant at around 8000 annually.

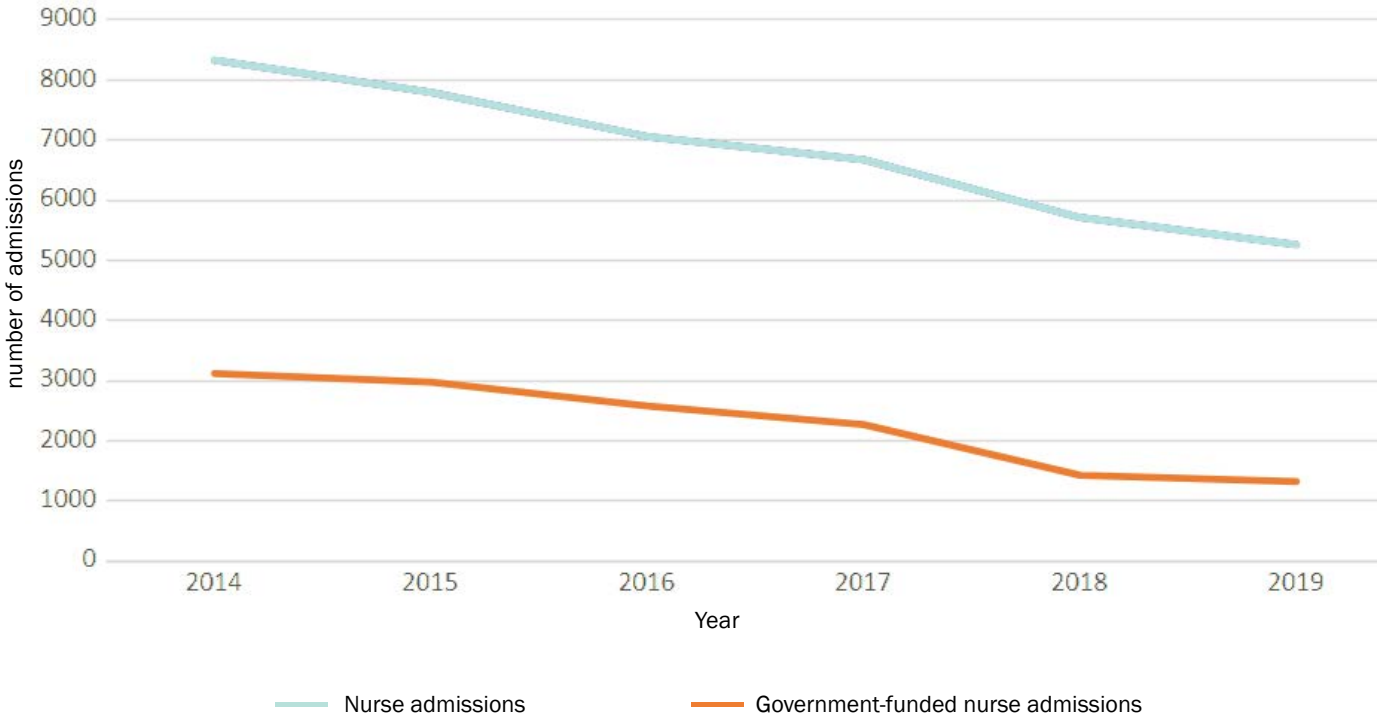
Fig. 33. Recent trend in number of admissions in nursing schools of Ukraine (2020–2023)



Source: MoH education data

However, the data available from the bulletins of the Public Health Centre provides a different picture of the trend in annual production (admissions) for nurse graduates in Ukraine from 2014 to 2019. The trend shows that the total number of admissions into nursing declined by 33%, from around 8300 in 2014 to 5300 in 2019 (Fig. 34). The number of nursing entrants funded by the Government also declined from 2014 to 2019. The annual admissions for nursing funded by the Ukraine Government declined by 57% from around 3100 in 2014 to 1300 in 2019. These numbers from the bulletins of the Public Health Centre do not reconcile well with the MoH data for 2020 to 2023.

Fig. 34. Trend in number of admissions in nursing schools of Ukraine (2014–2019)

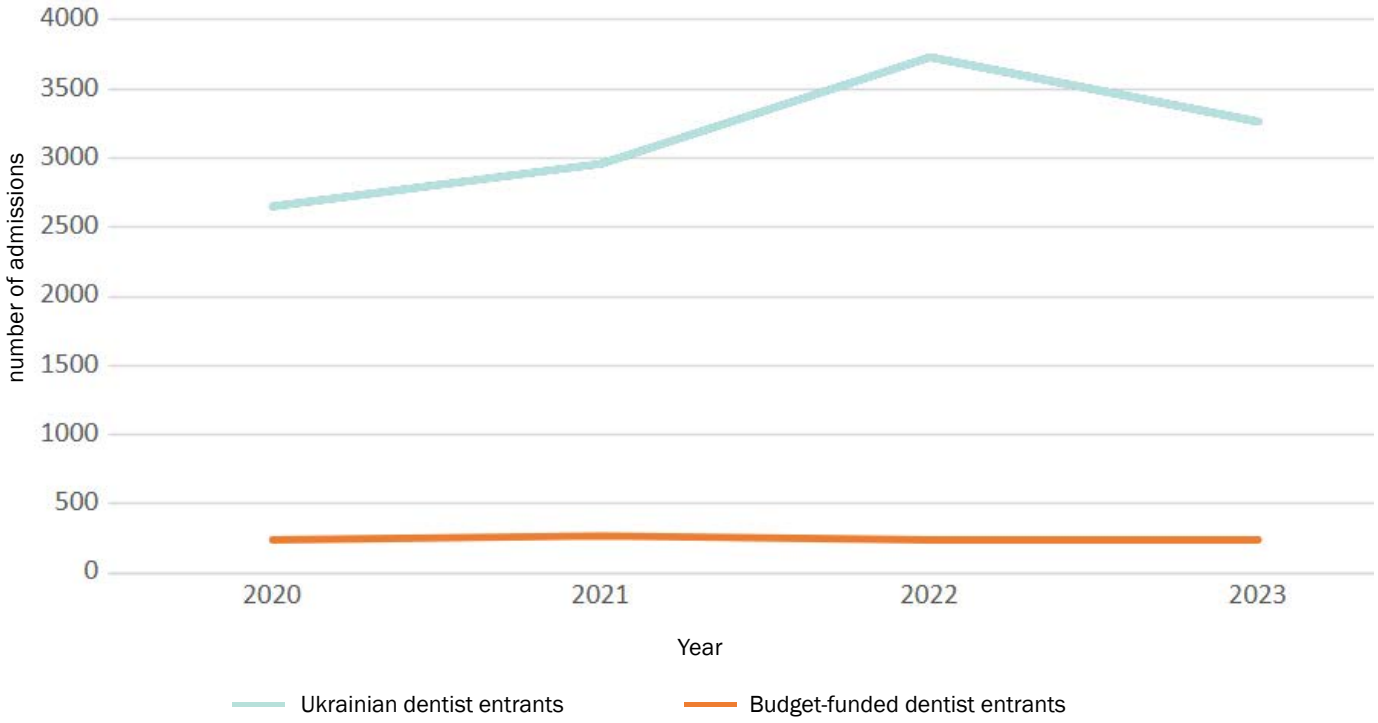


Source: Data from Public Health Centre of MoH Ukraine

Dentist entrants

International students represented around a quarter of the admissions into the dentist curriculum in Ukraine, but they became negligible in 2023. Between 2020 and 2022, the number of Ukrainian students entering the dentist curriculum increased before falling in 2023 (Fig. 35). Most of the domestic students in the dentist curriculum are self-funded.

Fig. 35. Trend in number of admissions in dentist curriculum in Ukraine (2020–2023)

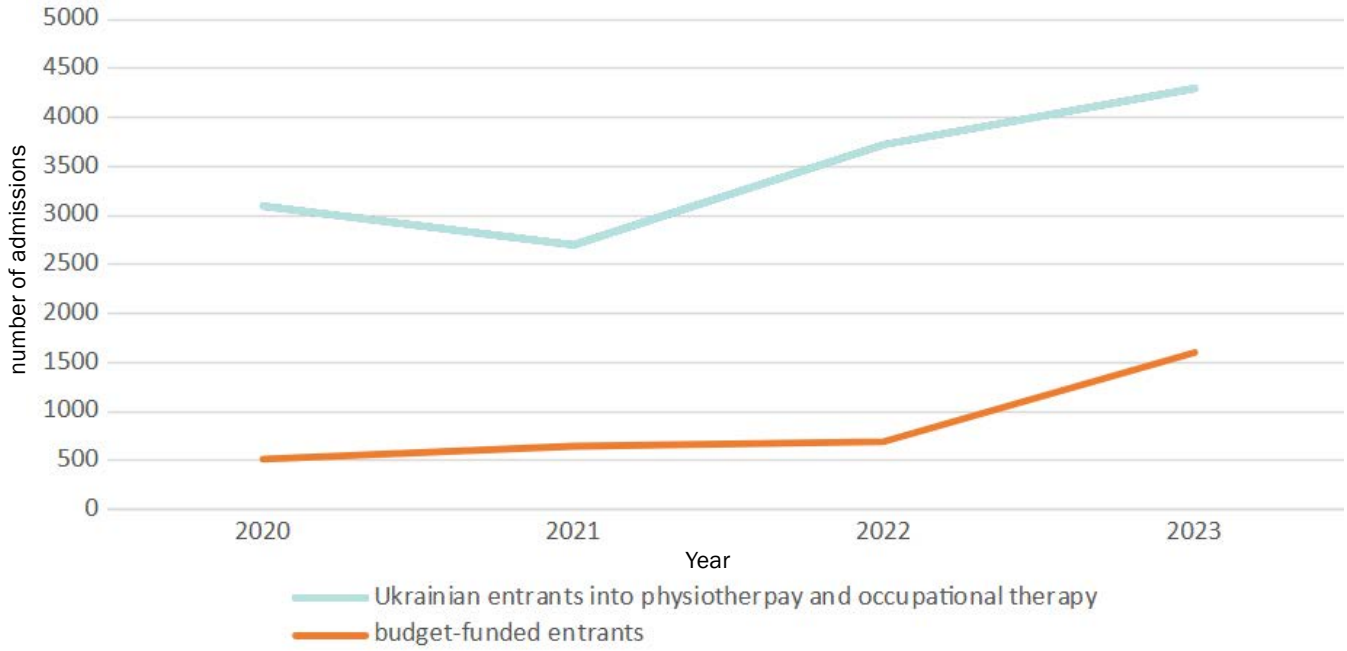


Source: MoH education data

Physiotherapy and occupational therapy entrants

Most of the students in the physiotherapy and occupational therapy curricula in Ukraine are domestic students. According to the data collected by the MoH, the number of entrants into these courses from 2020 to 2023 experienced an increase of around 40%. The government-funded admissions also rose sharply in 2023, which indicates the greater priority accorded to it by government (Fig. 36).

Fig. 36. Trend in number of admissions in physiotherapy and occupational therapy curricula in Ukraine (2020–2023)

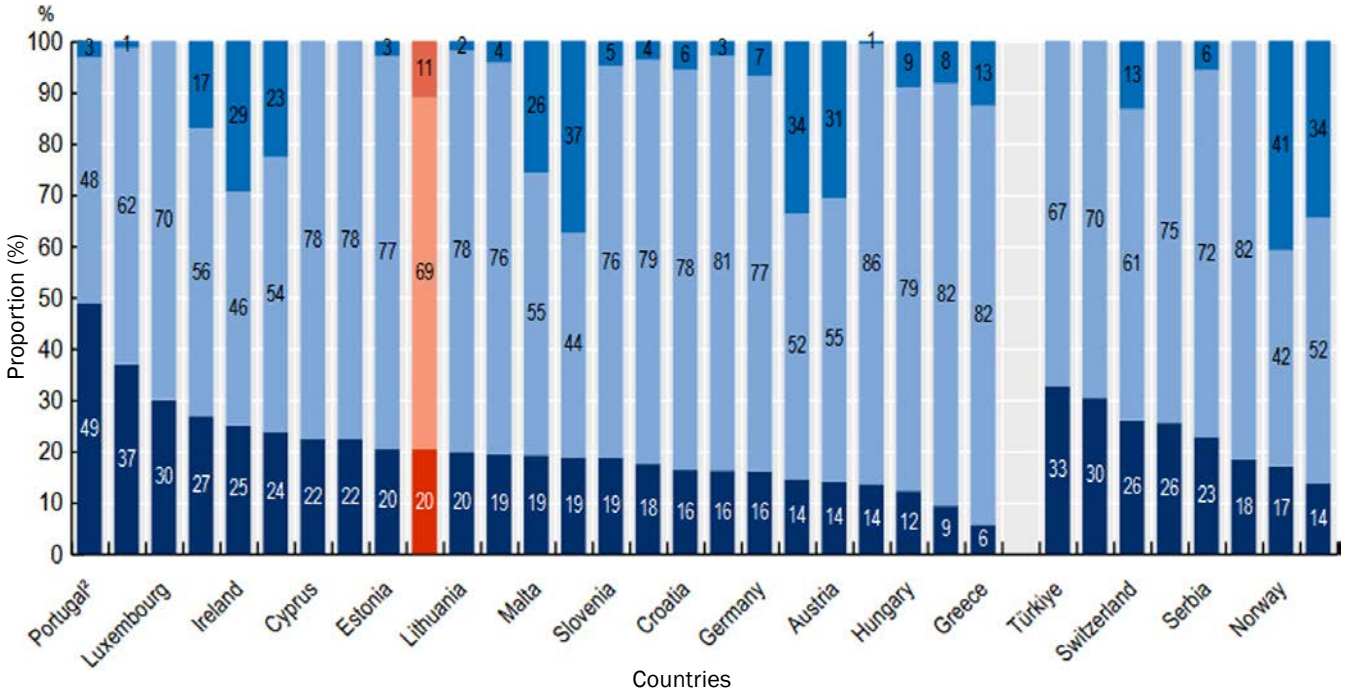


Source: MoH education data

4. Does Ukraine have an adequate workforce for PHC?

The PHC workforce in Ukraine is relatively small in relation to the workforce at secondary and tertiary care levels. Only 17% of doctors and 19% of nurses in Ukraine work in PHC. The EU average is similar with 20% of doctors being PHC doctors (general practitioners), according to the Organisation for Economic Co-operation and Development (OECD) (Fig. 37) *(17)*.

Fig. 37. Proportion of medical doctors working in PHC in EU countries



Source (13)

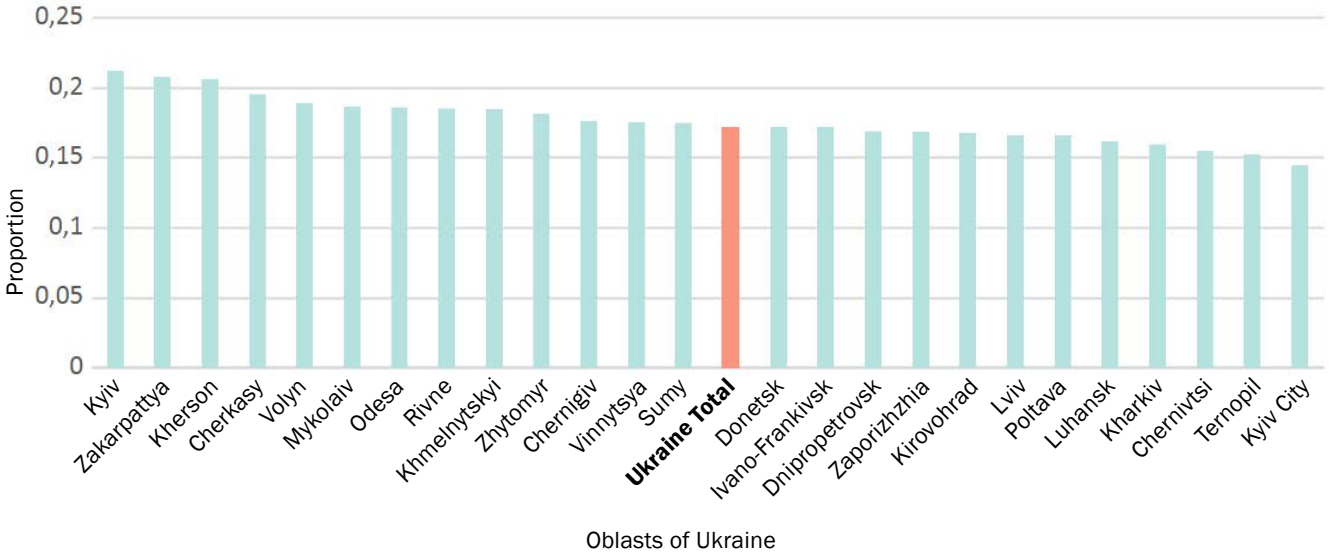
The density of PHC doctors in Ukraine is 5.53 per 10 000, whereas it is 8.93 in the WHO European Region *(18)*.

In Ukraine, a family doctor is expected to cover a maximum 1800 persons by national standards but 26% of them cover more than this limit (through declarations or capitation).

The PHC workforce in Ukraine consists mainly of family doctors and nurses. Other professions, such as physiotherapy, mental health and oral health, seem to be largely missing in PHC facilities.

The proportion of PHC doctors among all doctors varied across oblasts (Fig. 38).

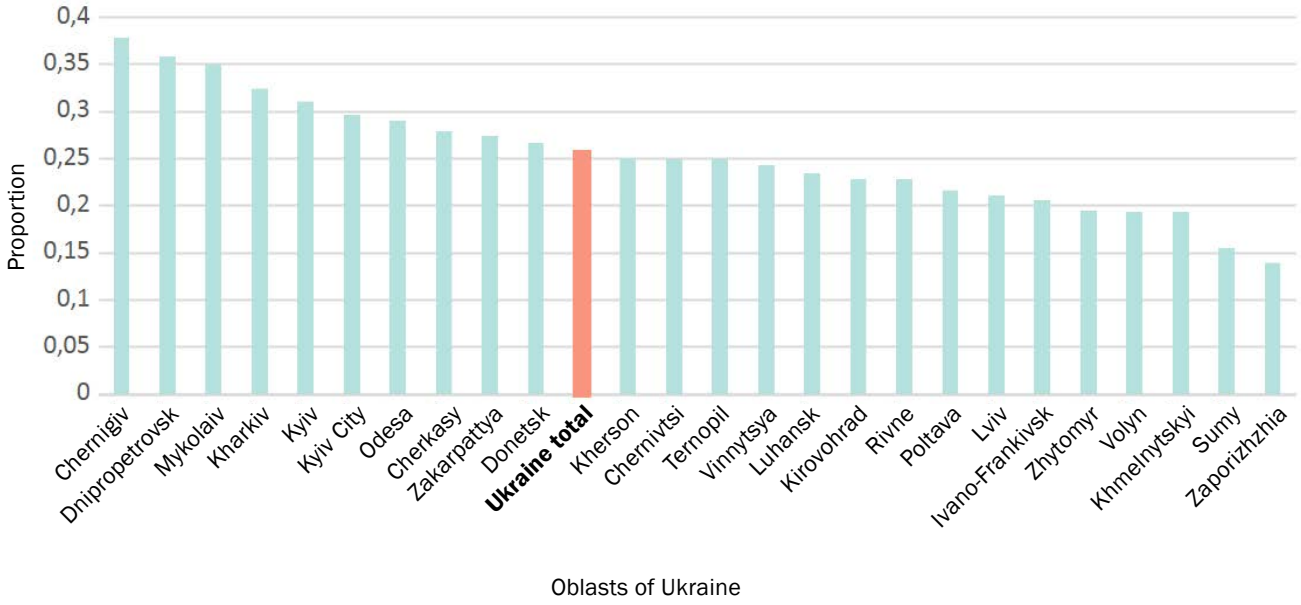
Fig. 38. Proportion of PHC doctors among all doctors in oblasts of Ukraine



Source: NHSU data (2023)

The proportion of family doctors with excessive workloads also varies across oblasts (Fig. 39).

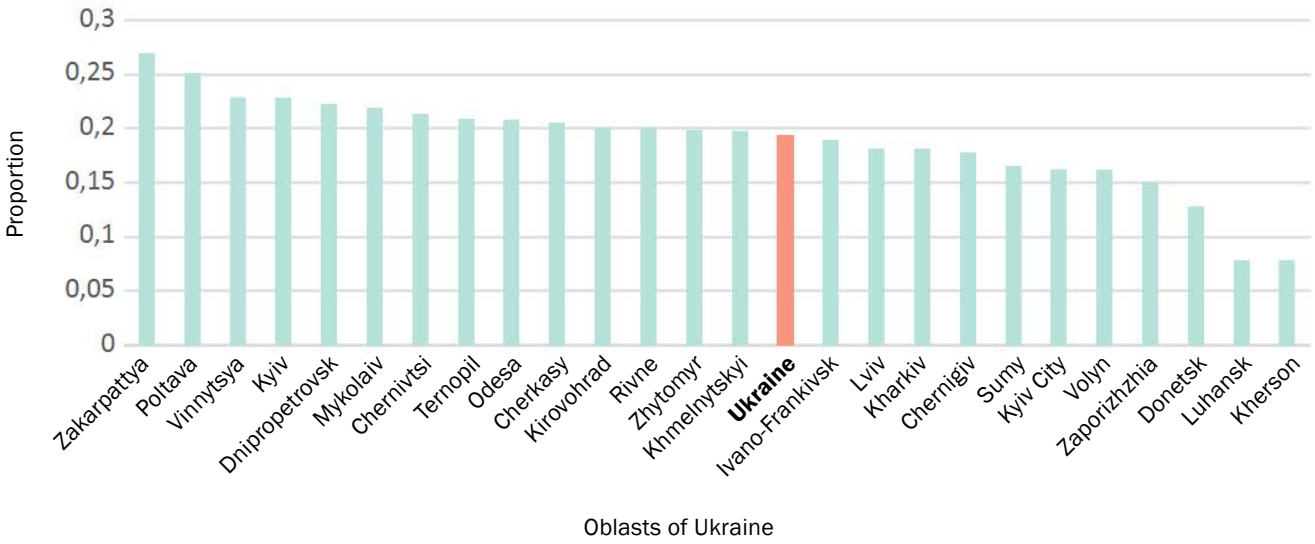
Fig. 39. Proportion of family doctors with more than 1800 declarations in oblasts of Ukraine



Source: NHSU data (2023)

The proportion of nurses working at the PHC level also varies across oblasts (Fig. 40).

Fig. 40. Proportion of nurses working at PHC level among all nurses in oblasts of Ukraine

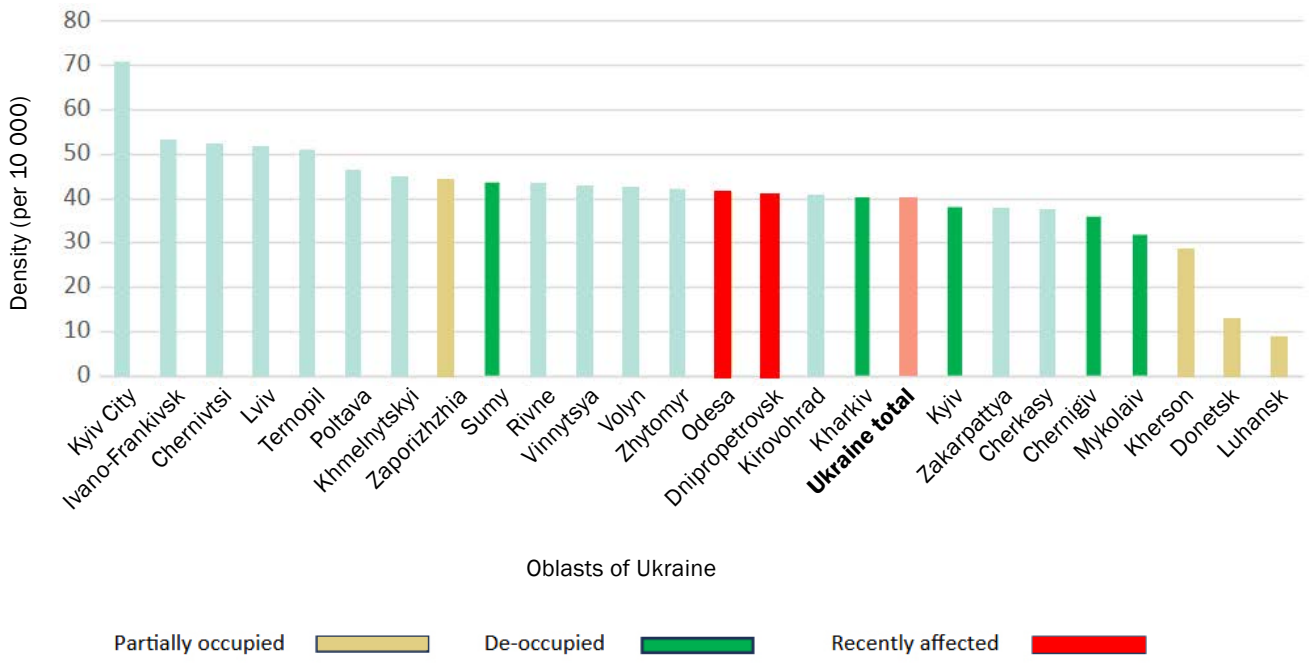


Source: NHSU data (2023)

5 How does the situation of the health workforce in regions directly affected by conflict compare with rest of Ukraine?

The doctor density is lower in many occupied and de-occupied regions as compared to the national average (Fig. 41). The biggest decline in doctors registered with the NHSU took place in the occupied regions. For example, in Luhansk from 2021 to 2023, the number of family doctors declined by 18% and number of specialists declined by 8%.

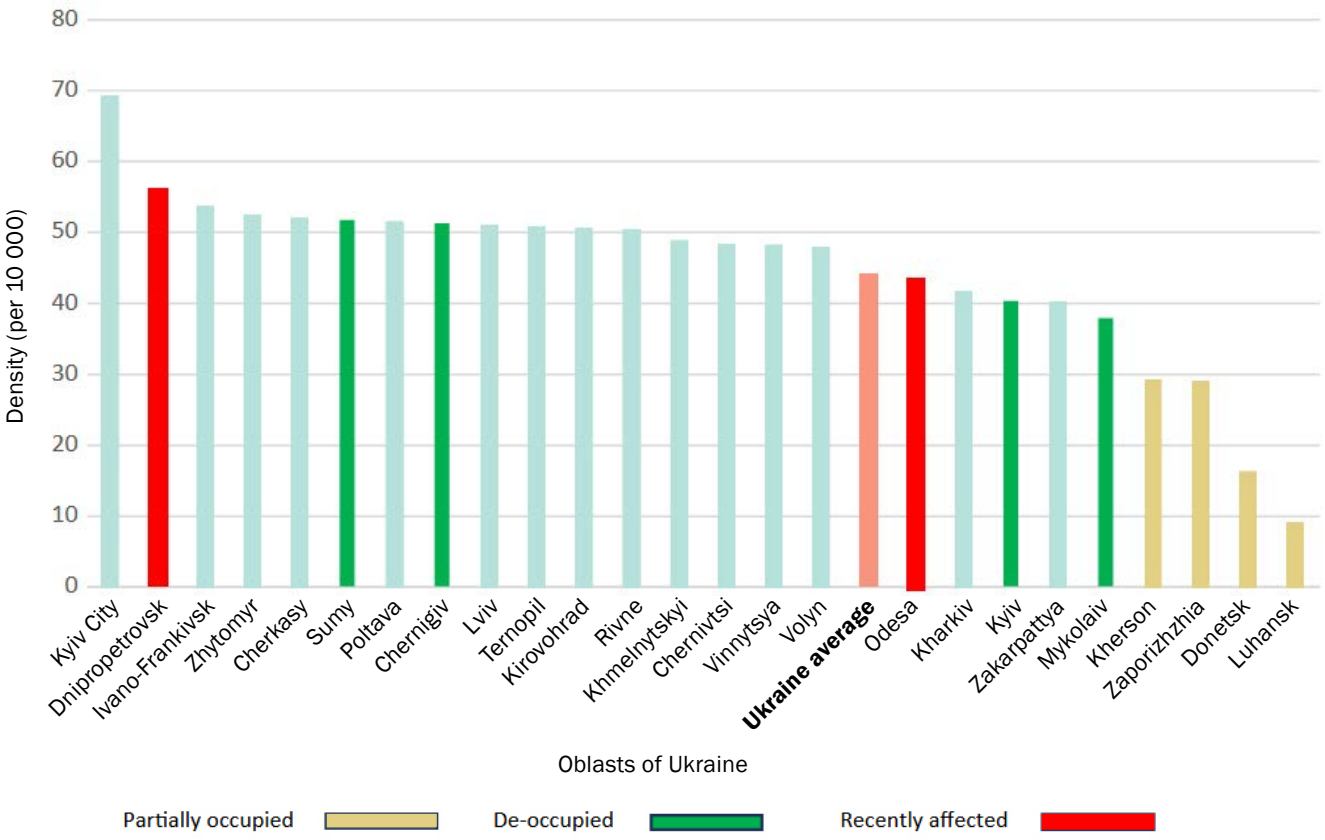
Fig. 41. Density (per 10 000) of doctors in oblasts of Ukraine (September 2023)



Source: NHSU data (2023)

The density of nurses is lower in most occupied and de-occupied regions (Fig. 42).

Fig. 42. Density (per 10 000) of nurses in oblasts of Ukraine (September 2023) (MoH data)

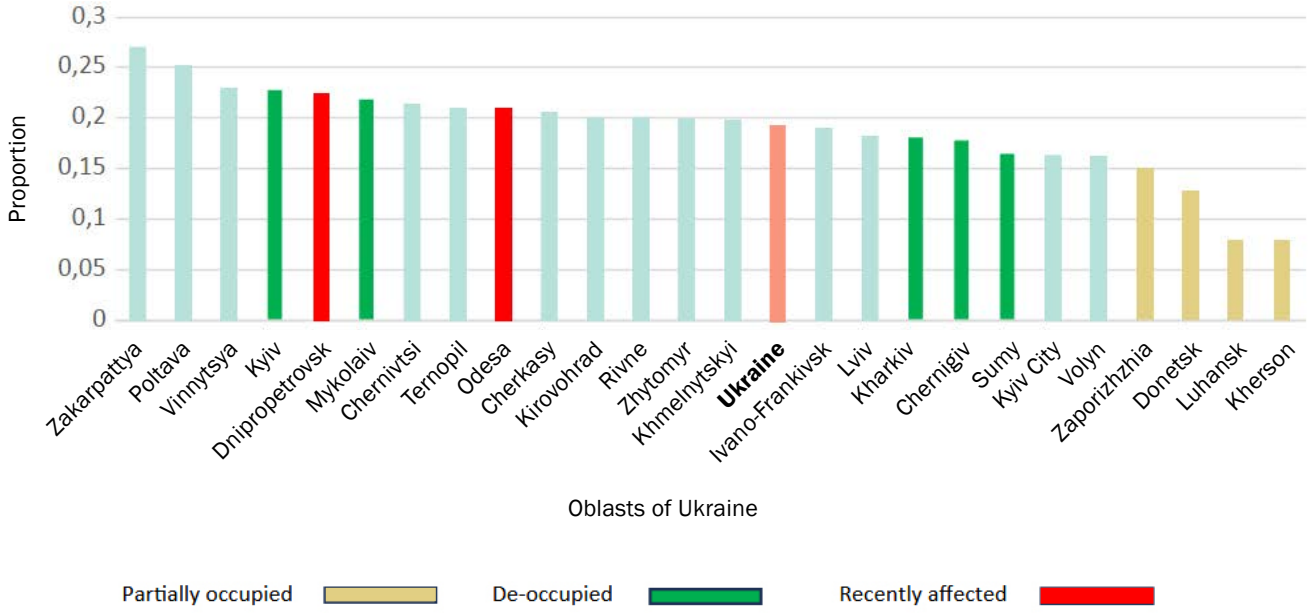


Source: NHSU data (2022)

The biggest decline in nurses registered with the NHSU appears to be in the de-occupied regions (e.g. from 2021 to 2023, a 12% decline in Lviv and 10% decline in Mykolaiv) and in some occupied regions (e.g. 8% decline in Donetsk and 6% in Luhansk, from 2021 to 2023).

The proportion of nurses working in PHC is lower in the partially occupied regions and some of the de-occupied regions (Fig. 43).

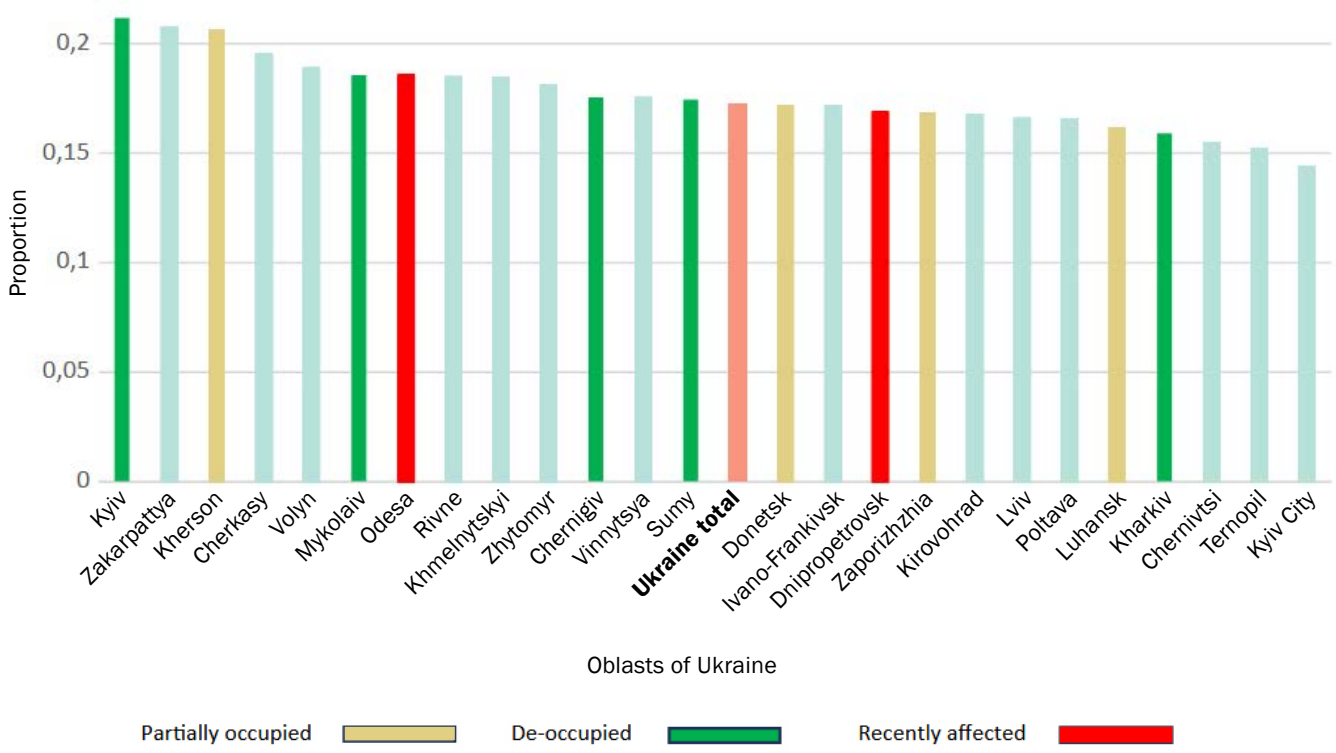
Fig. 43. Proportion of nurses working in PHC among all nurses in oblasts of Ukraine (September 2023)



Source: NHSU data (2023)

There was no clear pattern in terms of doctors working at the PHC level (Fig. 44).

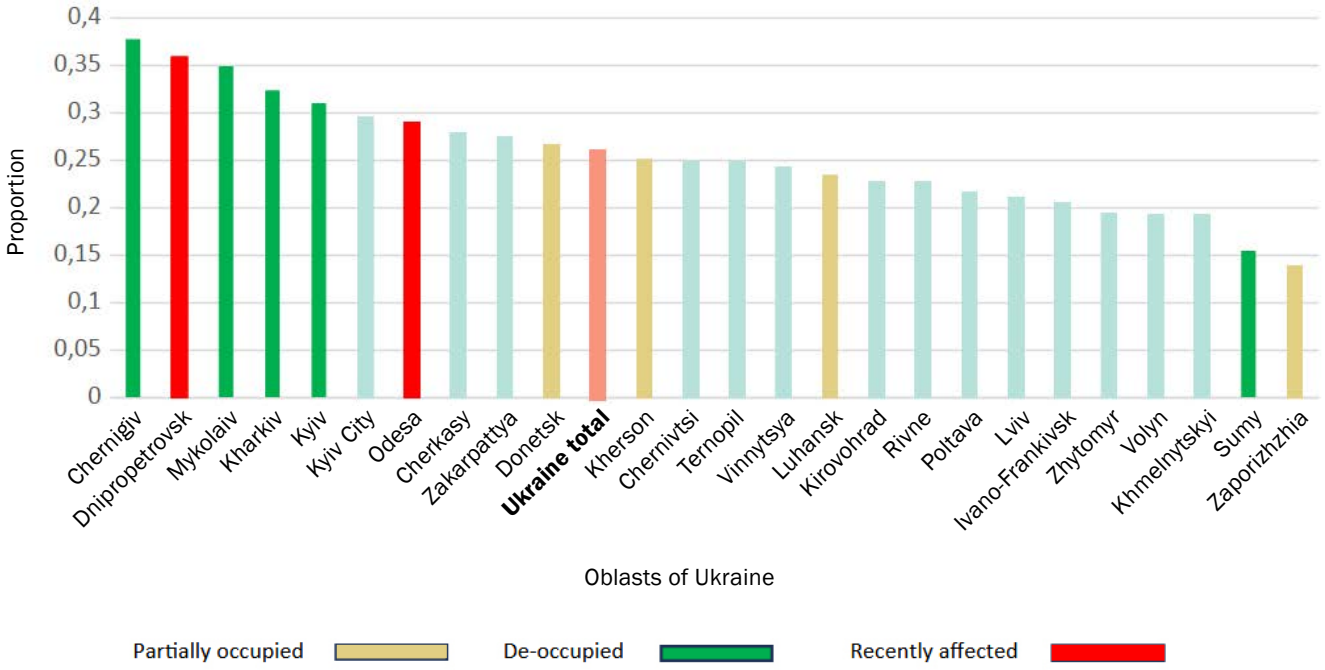
Fig. 44. Proportion of doctors working in PHC among all doctors in oblasts of Ukraine (September 2023)



Source: NHSU data (2023)

The proportion of family doctors with more than 1800 declarations did not show a clear pattern in terms of those working in conflict-affected areas and areas without active combat operations (Fig. 45).

Fig. 45. Proportion of family doctors with more than 1800 declarations in oblasts of Ukraine (September 2023)



Source: NHSU data (2023)

It is important to note that the impact of the conflict was not limited to oblasts directly affected by the conflict. The impact of the war seems to be nationwide with a sharp decline in the overall number of doctors and nurses.

Key issues emerging from the HLMA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1. Health worker shortages

Key issues include the following:

- Although Ukraine and the EU have a similar density of doctors, the numbers in Ukraine are very low in some key specialties, such as those related to trauma care, epidemiology, and mental health.
- Compared to EU countries, Ukraine has a significantly lower density of nurses, midwives, dentists and physiotherapists.
- The ratio of nurses to doctors is quite low in Ukraine in comparison to the EU average.

2. Declining trend in number of health workers deployed

Key issues include the following:

- The number of doctors and nurses in Ukraine have been falling overall since 2016. There is a persistent trend of a high rate of attrition among nurses. The decrease is most pronounced in public sector deployment. It is likely that many doctors and nurses prefer to migrate abroad. The war has led to increased rates of international migration. Many nurses in the country are working in non-health professions. The remuneration in public sector jobs is not attractive for doctors and nurses and many facilities are not keen to recruit due to financial constraints.
- The aging of health workers is a concern. While more than half of family doctors are likely to retire in a decade or so, the intake may not be enough as compensation. An aged workforce also indicates that the number of public recruitments has been low.
- There is a significant movement of specialist doctors from the public to the private sector – 1% to 3% per annum – which may cause a shortage in the public sector in a few years. Although the private sector is relatively small today, it is growing rapidly, especially in urban areas.
- The existing policies on attracting and retaining health workers, including for remuneration, may be insufficient.
- As a consequence of current financing policy at the PHC level – of declarations (capitation) linked to doctors in PHC facilities – there is little incentive for PHC facilities to hire nurses.
- Another study by WHO on the time use of the PHC workforce showed that nurses had to spend a significant amount of time on non-clinical tasks, such as entering data.

3. Vacancies

Key issues include the following:

- Around 15% to 25% of positions are vacant for doctors, nurses, midwives, physiotherapists, laboratory technicians, and X-ray technicians.

4. Issues in the production of health workers

Key issues include the following:

- The medical schools are facing a decline in finances because the fees from international students formed a major share of their funding before the conflict.
- The admissions of self-funded Ukrainian students have also declined sharply in 2023. It is likely that many are preferring to study abroad. It could be related to the uncertainty caused by the war and the rising preference to migrate.
- The shortage of specialists in a few key specialties, such as family medicine, emergency medicine, mental health, anesthesia, intensive care and epidemiology, could be due to low production.
- Family medicine is not a preferred specialization for the self-funded students. Among government budget-funded medical graduates, 13% are in family medicine. The production of family doctors does not match well with the need for PHC.

5. Geographical maldistribution

Key issues include the following:

- The density of health workers is extremely low in rural areas, including at the PHC level.
- A large proportion of existing vacancies are concentrated in rural areas.
- The density of health workers in oblasts directly affected by the conflict is low and has suffered greater attrition.

6. Inadequate PHC workforce

Key issues include the following:

- Less than a fifth of doctors and nurses are deployed in PHC work.
- There is a shortage of PHC doctors, as reflected in the following: vacancies are around 20%, doctors are aging, around a quarter of family doctors exceed the norm of 1800 declarations, and there is a lower density of PHC doctors in comparison to the WHO European Region average.
- Many necessary skills for comprehensive PHC seem to be missing in PHC teams, as they consist mainly of family doctors and nurses and their current training does not cover many crucial areas.
- Family medicine seems to be less of a preferred specialization as only 2% of the self-funded medical interns were in family medicine. Among government budget-funded students, family medicine constituted 13%.

7. Weak systems for data collection and analysis on HRH

Key issues include the following:

- The current systems are inadequate in collecting routine data on many important elements of HRH, such as the education of various types of health workers, migration of health workers, number of recruitments, number of retirements, and age of health workers. Many data elements are collected on-demand or on an ad-hoc basis. As a result, the periodic analysis of HRH and monitoring of trends or changes becomes difficult. This can hamper HRH planning and evidence-based policy-making for a stronger health workforce.
- There are multiple versions of data collected by the MoH and NHSU. There are sometimes wide variations in data reported by different channels; for instance, the number of nurses graduating in a year varied substantially between the kadry bulletins and the data collected by the MoH.
- The NHSU is gradually building a system to collect HRH information, but it is limited to the facilities contracted by it. Recently, regulations have been introduced making it mandatory for all medical facilities, irrespective of ownership, to report data on the e-health platform of NHSU but it remains to be seen how well it will be enforced.
- Many health workers working in the private sector are likely to get missed in the current data collection system. This is particularly true for dentists and physiotherapists and, to some extent, nurses.

8. Impact of the conflict on the health workforce in Ukraine

Key issues include the following:

- The health workforce in areas directly affected by the conflict has been affected the most. But the conflict has impacted the health workforce in all of Ukraine. The adverse impact is in many crucial aspects of HRH, ranging from education and absorption to increased migration and challenges in the retention of health workers, leaving a depleted health workforce in many parts of the country.
- There is evidence of increased emigration of doctors, nurses and other health professionals from Ukraine since the conflict started. Countries receiving the refugee population, including the health workers, had to facilitate accessible pathways for the Ukrainian health workers to be able to practice. It has become more difficult for Ukrainian health facilities to attract and retain health workers.
- The sharp decline in the admissions of international students has severely affected the finances of medical education institutions. The admissions of self-funded Ukrainian medical students have fallen significantly, and this could be related to the uncertainty caused by the conflict.

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Recommended actions

1. Strengthening the human resources information system

There is a need to set up a system whereby the necessary data on HRH is collected routinely and is analysed periodically to inform HRH planning and policy-making. Among the existing systems, the NHSU database holds the most promise to capture the data on HRH. Its key strength is that it collects annual data with the individual health worker as a unit. This can help in many kinds of useful analyses, which is not possible when using aggregate data. It has been a gradual process so far. The NHSU has been adding occupations one by one and there are many cadres yet to be covered. The information captured on PHC-level HRH is also currently limited and incomplete. Further, this system is yet to cover the private sector facilities which are not in a funding contract with the NHSU; a recent regulation aims to change this but enforcing it may not be easy. The NHSU is primarily a purchasing or financing agency and playing a stewardship role with respect to HRH may not be part of its defined responsibilities. As a result, the NHSU collects information on HRH that covers only currently deployed health workers. Its defined role does not involve collecting data on many other crucial HRH dimensions, such as the education or migration of health workers. The MoH does play a stewardship role for HRH but has limited data to support its work. This means that the MoH must collect data when needed. Further, it collects aggregate data from oblasts, who in turn collect it from health facilities. The MoH and NHSU should collaborate so that relevant data is collected routinely and utilized for analysis, leading to strengthened HRH in Ukraine through evidence-based planning and policy-making. For data on education, an agreement is needed between the ministries of education and health so that the Ministry of Education provides data regularly to the MoH.

2. Aligning HRH strategies with PHC and other national health systems' priorities and policies

The Ukraine MoH has decided to move towards a PHC-oriented approach to develop its health systems. If PHC is a clear priority, the HRH strategies should be aligned with it. A crucial milestone can be to ensure primary care for NCDs through the current structure of PHC teams consisting of family doctors and nurses. The existing teams can also play a role in mental health and other priority needs in PHC with appropriate additional training.

In the longer run, there will be many kinds of services to be integrated to achieve comprehensive PHC. The PHC teams need skills in many areas, such as rehabilitation, mental health, public health emergencies, oral health, social work, nutrition and long-term care. Strengthening the PHC workforce may be required in the longer run to create multidisciplinary and multiskilled PHC teams. This in turn will require changes in the training of health workers to suit the demands of PHC. Also, if an increase in health workers' deployment is planned, it can be aligned with the HRH requirements of PHC and needs of rural areas.

There are several national priority areas, such as: managing health emergencies; addressing certain health needs that have increased due to the ongoing conflict, such as trauma care, mental health and rehabilitation; maintaining access to health care in conflict-affected areas; and meeting the expanded health needs of an aging population. These priorities have implications for the services the health systems seek to deliver. The number and types of health workers required in the health system will depend on the expected services and the way service delivery is organized. In addition to the changes in the PHC teams, there may be a need to consider an increase in the hospital workforce in order to meet some of the current priorities, which are that specialist doctors and other health workers should be trained and deployed in a few key areas, such as trauma care, rehabilitation and mental health.

3. Optimizing existing occupations in the health workforce

The roles in which many of the health workers are currently deployed may not be utilizing the workers' full scope of practice. Expanding the roles of some occupations, such as nurses, can be considered. Although this analysis could not cover the feldshers, steps to optimize their roles can also be explored. Nurses often spend a considerable amount of time on non-clinical tasks, such as entering data, thereby reducing their availability for actual service delivery. If other assistants can be added to the workforce to take such tasks away from qualified nurses, this would allow for better utilizing the skills of qualified nurses and could make public sector jobs more satisfying and attractive to them.

4. Identifying and overcoming barriers to the public sector recruitment of available health workers

The production of nurses and doctors does not appear to be the bottleneck. Rather, there is a need to strengthen the deployment of available nurses and doctors given that low public sector recruitment over the last decade appears to be a key bottleneck in the country. Public recruitment appears to have been in decline for a decade and the situation became worse due to the impact of the COVID-19 pandemic and conflict. The aging health workforce also indicates low recruitment in recent decades. The analyses undertaken in this HLMA point towards the possibility that many health workers graduating recently are not getting absorbed by the public sector.

5. Comprehensive measures needed for improving retention in rural areas and frontline regions

There is little doubt that the availability of health workers in rural areas is far poorer than in urban areas. This has implications for PHC. In order to recruit and retain enough health workers in rural areas, comprehensive strategies need to be implemented – detailed guidance is available in the updated guidelines of WHO on the rural retention of HRH (*19*), which includes a bundle of strategies that are not limited to increasing financial incentives. Strategies will be needed to cover the areas of education, regulation, incentives and personal and professional support. While it is clear that the frontline regions will require measures to improve retention, further efforts are recommended to develop suitable strategies.

6. Strengthening government financing for health worker education

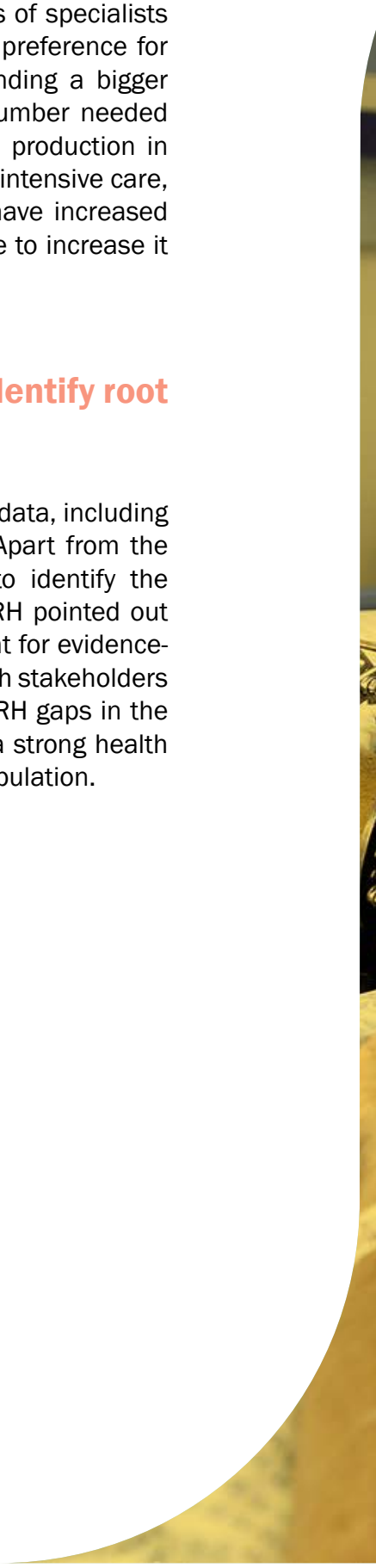
The medical schools in Ukraine depend heavily on international students to finance their basic requirements. But hardly any of the international graduates are deployed to deliver services in Ukraine. This dependence of medical schools resulted in a funding crunch after the conflict started and the number of international students decreased sharply. An increase in government funding to public sector medical schools needs to be considered so that they can retain their teaching faculty.

Furthermore, the number of government budget-funded admissions has remained stagnant while the number of admissions of self-funded medical students declined sharply in 2023. An increase in the number of government budget-funded admissions in public sector medical schools to compensate for the decline in self-funded admissions can be considered. Such a measure can be useful for arresting the recent decline in admissions of Ukrainian students. This will prevent a potential shortage of medical graduates in the future and also improve the current funding situation for medical education institutions.

The recommended increase in government budget-funded admissions can be further useful if it is aligned with increased production of the types of specialists that show the greater shortage in relation to need. Given the low preference for family medicine among self-funded medical students, budget funding a bigger number of doctors in family medicine can help in meeting the number needed for PHC. Budget-funding can be used also as a lever to increase production in other high priority areas, such as emergency medicine, anesthesia, intensive care, epidemiology and mental health. Admissions into physiotherapy have increased recently as a result of government priority and there may be a case to increase it further.

7. Undertaking further dialogue and analysis to identify root causes of HRH gaps

The current HLMA exercise was carried out with some limitations of data, including some key dimensions, such as the migration of health workers. Apart from the limitations of data availability, further investigation is needed to identify the contextual factors that have contributed to the various gaps in HRH pointed out by this HLMA. The current HLMA offers a baseline and starting point for evidence-based preparation of HRH strategies in Ukraine. Further dialogue with stakeholders and analysis is recommended to find out the root causes of the HRH gaps in the country. Such analysis will clarify the policies needed for building a strong health workforce in Ukraine, capable of meeting the health needs of its population.



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