

TRENDS IN THE EVOLUTION OF THE NUMBER OF ROMANIAN AND FOREIGN PHARMACISTS WORKING IN ROMANIA DURING THE TIME FRAME OF 2018 TO 2027

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Abstract

The place of the pharmacist among the medical professions is intensely debated worldwide. In this research, we analysed a current issue for the Romanian pharmaceutical system regarding registering pharmacists in the College to obtain the right to practice in Romania. We used descriptive analysis and forecasting techniques for data obtained from the Romanian College of Pharmacists regarding the number of membership certificates issued between 2018 and March 2023, as well as to forecast the evolution of graduates from the Faculty of Pharmacy in Bucharest, Romania. The main result of the research was the decreasing trend of the number of professionals practising pharmacy in Romania, an evolution that remained unchanged even after the COVID-19 pandemic. Migration management measures, training, development and maintenance of a more sustainable pharmaceutical workforce are needed, without which the national health system cannot provide quality services and effective treatments to meet the population's healthcare needs.

Rezumat

Locul profesiei de farmacist printre profesiile medicale este intens dezbătut pe plan mondial. În această cercetare am analizat o problemă de actualitate pentru sistemul farmaceutic românesc privind înscrierea farmaciștilor în Colegiu în vederea obținerii dreptului de a profesa în România. Am folosit analiza descriptivă și tehnici de previziune pentru date obținute de la Colegiul Farmaciștilor din România privind numărul de certificate de membru eliberate în perioada 2018 – martie 2023, precum și pentru a prognoza evoluția absolvenților din cadrul Facultății de Farmacie București, România. Rezultatul principal al cercetării a fost trendul descrescător al numărului de profesioniști care exercită profesia de farmacist în România, evoluție rămasă neschimbată inclusiv după pandemia COVID-19. Sunt necesare măsuri de gestionare a migrației, formare, dezvoltare și menținere a unei forțe de muncă în domeniul farmaceutic mai sustenabile, fără de care sistemul sanitar național nu poate oferi servicii de calitate și tratamente eficiente care să satisfacă nevoile de îngrijiri de sănătate ale populației.

Keywords: pharmacists, migration, pharmacy profession, healthcare

Introduction

The expansion of the European Union and the various financial and economic crises have led to an increase in the worldwide migration phenomenon of human resources and the health field.

The mobility of health professionals' influences health systems' efficiency by changing the labour force structure in countries of origin and destination [1, 4, 5, 8], changing professional skills and abilities, and the distribution of workers in this sector.

The effects corresponding to continuous mobility over time can be of decreasing or increasing the performance of health systems through the loss or gain of some rare and essential skills possessed by professionals [3, 4, 7, 9]. At the same time, accessibility to health care services is affected, which leads to undersupplied areas without sufficient employees in the health field.

In the specialized literature, the mobility process of health professionals has two dimensions: ethics and efficiency [4, 13, 14]. From an ethical perspective, migration outside the EU complies with national norms and international codes, and migration within the EU is guaranteed by treaties that limit the options to block it. The ethics of destination member states that rely on flows of professionals from abroad to supplement their workforce are also discussed [10, 16, 20-22].

The mobility of health personnel can capitalize on the objectives of health workforce policy but also undermine health systems if the evaluation is not appropriate.

Although seemingly opposed, mutually exclusive policy challenges, the ethical and efficiency dimensions of health worker mobility influence the forecast of the lack and need of the labour force, the sustainability and dynamism of the mobility of health professionals, as well as the monitoring of recruitment practices, all

contributing to a growing interdependence between countries and health systems [4, 8, 18, 23].

Along with the decrease in financial, material and human resources (the unemployment rate), the pressure on health systems to limit expenses and increase the efficiency of the labour force by optimizing the use of skills and abilities, redistributing or retraining medical personnel increased [22, 23]. The European authorities encourage research to adopt measures and implement programs.

An example was the MUNROS project (2012 - 2017, funded by FP7 HEALTH, global budget € 3764949.20, EU contribution € 2999660.25) [2] in which nine countries participated (England, Czech Republic, Germany, Italy, Norway, the Netherlands, Poland, Scotland and Turkey) and analysed the impact on practice, outcomes and cost of the new roles for health professionals [9, 10].

The project results indicated that in countries such as England, Germany, the Netherlands and Scotland, pharmacists have an essential contribution to the education and monitoring of the therapy of patients diagnosed with cardiovascular disease and breast neoplasm. This aspect is explained by the reforms to reorganize and expand health services and the roles of non-medical professionals, including the introduction of prescription rights (England and Scotland).

The WHO Global Code of Practice recommends, for effective and sustainable workforce planning and retention of health workers, to reduce over-reliance on international recruitment and promote individual treatment of mobile health workers [20].

WHO estimates a 10 million health workers shortage by 2030, mostly in low- and middle-income countries [21].

Thus, to ensure equitable access of the population to medical personnel, the WHO and its partners developed the Global Strategy on Human Resources in Health: Workforce 2030 [22], accelerating progress towards the main objective: universal health care. By the resolution of this act, member states are urged to centralize data related to human resources in health and to report them annually to the Global Health Observatory; the information will also support national policies in the field.

The migration of pharmacists is recognized in WHO reports [20-23], and the determination of mobility patterns is a problem because factual statistical data are unavailable.

According to the provisions of the European Directive 2005/36/EC [17, 19], the title of pharmacist is a professional qualification recognized in the EU based on the fulfilment of minimum requirements regarding the number of training hours and internships. After the equivalence of studies, pharmacists can work in member states other than the one of origin, based on the European Professional Card (CPE). This electronic

certificate certifies that the professional has fulfilled all the necessary conditions to temporarily and occasionally provide services in a Member State and the recognition of qualifications for establishment in the host Member State. The CPE allows the beneficiary to practice the profession in the host Member State under the same conditions as its nationals.

In most European countries, data on the migration of doctors are known, but there is a lack of information on the mobility of pharmacists [4, 9, 15].

Aspects regarding the emigration of the Romanian pharmacists and the need for better regulations in the pharmaceutical field were discussed in a previous paper [12]. In the present paper, we decided to develop and deepen the research on the migration of pharmacists in order to provide information about immigration and the exercise of the profession of pharmacist in Romania by foreign citizens.

We set out to comparatively study data on foreign and Romanian pharmacists newly enrolled in the College of Pharmacists.

The study can provide helpful information to the competent authorities regarding the legal framework for authorization to practice the profession of pharmacist, the evolution and future trends of the migration of pharmacists of other citizenships in Romania in order to develop appropriate measures to encourage circular migration and sustainable development of the pharmaceutical workforce to bring added value to health care.

Materials and Methods

The materials used were reports on foreign and the Romanian pharmacists newly enrolled in the College of Pharmacists in the last five years [24] and data on graduates of the Faculty of Pharmacy in Bucharest, Romania with foreign citizenship from 2018 - 2022 [25].

We analysed the applications of pharmacists of other citizenships who received the right to practice freely in Romania according to the number: country of origin, the county in which they practice and field: health (community and hospital pharmacy), economic (warehouse, industry, production), administration.

We used elements of descriptive statistics - frequencies and percentages - to describe the results obtained and time series forecasting techniques - linear regression and the moving average method in Excel 2016. The latter method involves determining average values based on several observations of the analysed dynamic series. The forecast can be made using the following formula:

$$P_{t+1} = \frac{X_t + X_{t-1} + \dots + X_{t-n+1}}{n} = \frac{1}{n} \sum_{i=t-n+1}^t X_i$$

where, P_{t+1} – predicted value for period $t + 1$; X_t – observed value from period t ; n – the number of

periods (observed values) used in calculating the average; for this research, we considered $n = 3$.

Results and Discussion

Between 2018 and 2023 (the month of March), 5722 membership certificates (MC) of the College of Pharmacists were issued for Romanian pharmacists (5638) and other nationalities (84). From Figure 1, it can be seen that the highest number of registrations for Romanian citizens was registered in 2019 (1250), and then here was a gradual decrease until 2022 when 971 CMs were registered.

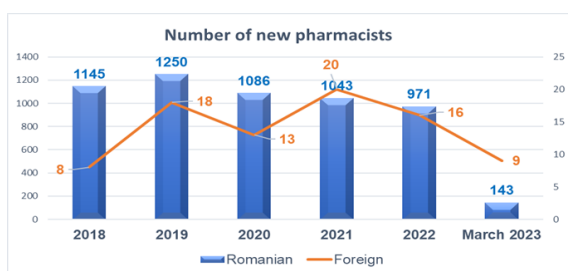


Figure 1.

Evolution of Romanian and foreign pharmacists between 2018 and March 2023

The 2018 - 2019 period was one of recovery after the economic crisis of 2017, and the number of the pharmacists who obtained the right to practice freely increased accordingly. The 2020 - 2022 interval was influenced by the coronavirus pandemic in which pharmacists working in pharmacies were alongside doctors in the first line of population assistance. Some recent graduates expressed their reluctance to obtain the MC and practice the profession, preferring instead to wait; this option was also influenced by the hiring freeze, including in research and production laboratories, wholesale distribution, education and administration. Like other states, Romania also applied measures to restrict the mobility of the population and professionals in the health field, which reduced requests to enrol in College: 1086 in 2020, 1043 in 2021 and 971 in 2022.

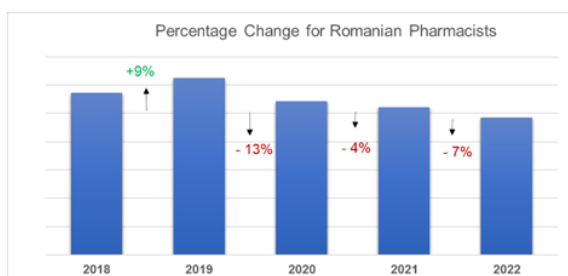


Figure 2.

Relative change in number of new Romanian pharmacists

The evolution of the number of MC issued for the pharmacists with foreign citizenship also shows a downward trend with two maximum values in 2019 (18) and 2021 (20).

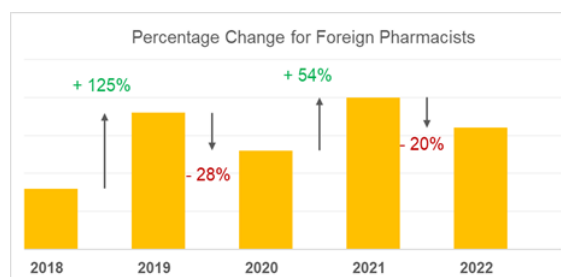


Figure 3.

Relative change in number of new foreign pharmacists

In 2019, 9% more MCs were issued compared to 2018 for Romanian pharmacists and 125% more for pharmacists coming from outside. This was followed by a reduction in requests of 13% (Romanians) and 28% (foreigners) in the 2019 - 2020 period. The relative percentage decrease in the number of new Romanian pharmacists continued in the following period, being 4% and then 7%. The number of the pharmacists of other ethnicities increased by 54% in 2021, but subsequently also recorded a decrease of 20%.

One explanation for the reduction in the number of pharmacists with the right to practice is the loss of interest in this profession, with students preferring better-paid jobs (doctor) or in other fields, not the health profession.

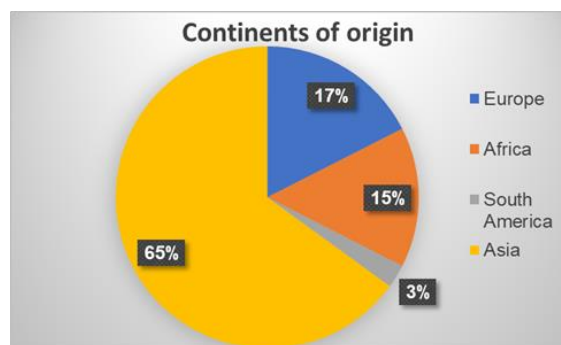


Figure 4.

Frequency of distribution of foreign pharmacists

The analysis of the countries of origin revealed that pharmacists with foreign citizenship come from 4 continents: Asia, Europe, Africa and South America. 65% come from Asia: Iraq, Iran, Israel, Lebanon, Syria and Turkey, countries facing wars and natural disasters; 17% from European countries Germany, Greece, France and Sweden 15% from less developed states in Africa (Egypt, Morocco, Sudan and Tunisia) and 3% from Brazil.

Foreign pharmacists are interested in practising in Romania because of the legislation regulating the permissive registration requirements and because sometimes, after gaining experience, they can leave here for better-developed countries. For example, some pharmacists who wish to practice in South Africa cannot meet the requirement of practising for one year in public service. It determined that in 2001, out of 1000 pharmacist graduates, 600 emigrated [6]. Studies in the field [7, 8, 11, 15, 21] have indicated the following causes of migration: low standard of living, poverty, lack of a job, ethnic problems, the existence of crises resulting from natural disasters, technological accidents or terrorism, or even financial crises, political crises and social conflicts etc.

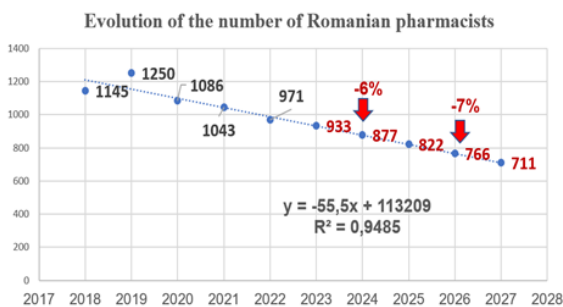


Figure 5.

Forecast trend for the new Romanian pharmacists

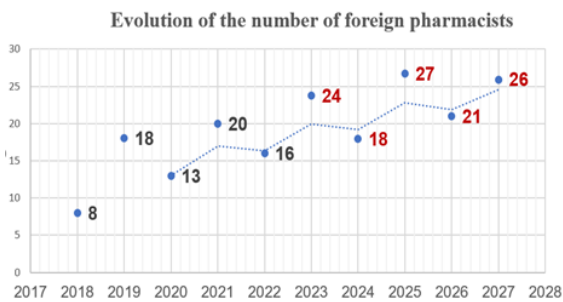


Figure 6.

Forecast trend for the new foreign pharmacists

In order to predict the evolution of the number of pharmacists who will apply for the authorization of pharmaceutical activities on Romanian territory in the next five years, we used the linear regression method for professionals with Romanian citizenship and the moving average method for foreigners. We obtained the mathematical model illustrated in Figure 5, for which the R^2 coefficient has a value of approximately 95%. This indicates that the relationship between the number of pharmacists and year of enrolment, described by the linear equation, explains 95% of the variation in the data.

Based on the calculations, we can thus predict that the number of Romanian pharmacists who will apply for MC will decrease in the next five years by 6% (in 2024 compared to 2023) and by 7% (in 2026 compared to 2025), reaching 711 in 2027.

Through the results shown in Figure 6, it can be seen that the trend is upward, *i.e.* the number of pharmacists of other citizenships will increase over time by 19% to 33% if the economic-social climate in the countries of origin does not improve, *i.e.* the conditions for authorization of pharmaceutical activities in Romania will remain the same.

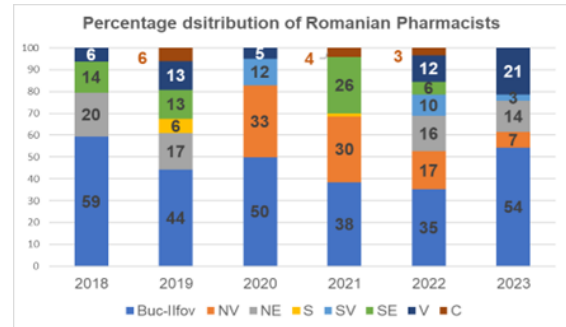


Figure 7.

Allocation of new Romanian pharmacists on the development regions

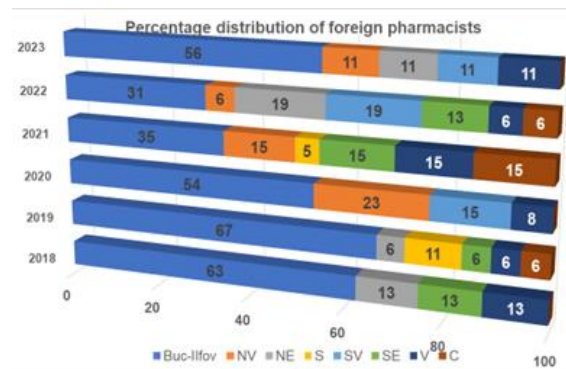


Figure 8.

Allocation of new foreign pharmacists on the development regions

Figure 7 and Figure 8 show the distribution of the pharmacists newly enrolled in the College of the Pharmacists on the eight development regions of Romania (Bucharest-Ilfov, NW, NE, S, SW, SE, V and C-centre). The tendency is to migrate from south to north, respectively, from east to west.

The frequency of requests for Romanians and foreigners was the highest in Bucharest-Ilfov (with a variation from 59% to 54% for Romanian pharmacists and from 63% to 56% for those of other citizenships during 2018 - March 2023).

Applying the same forecasting methods for pharmacist graduates from Bucharest, we obtained the results shown in Figure 9 and Figure 10. The R^2 value = 0.86 indicates a minor data variation of 86% compared to the average along the regression equation below (Figure 9).

There is a tendency to reduce the number of graduates in Pharmacy from Bucharest by up to 11% in 2027 (for Romanian students). The number of graduates with

foreign citizenship registers statistically insignificant decreases compared to 2022, remaining almost constant at 9 - 10% of the total graduates.

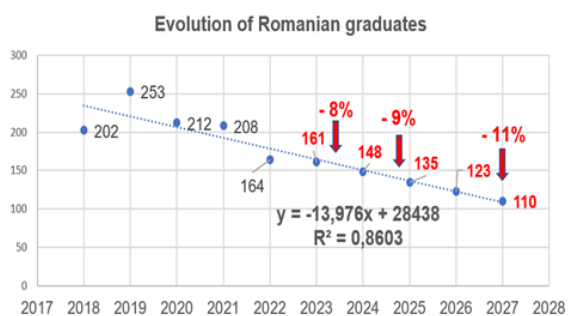


Figure 9.

Trends in the evolution of Romanian graduates

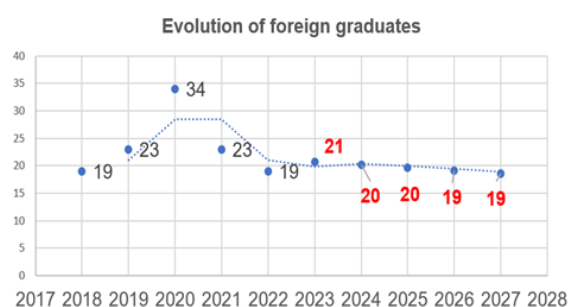


Figure 10.

Trends in the evolution of foreign graduates

Regarding the sector in which they operate, the majority of pharmacists in Romania will be employed in 2023 [20] in pharmacies (10,936), warehouses, industry, production (652), education, research (206) and administration (60).

Conclusions

From a public health perspective, the migration of health professionals produces a shortage of health personnel and indicates a weak absorption capacity in the labour market.

The results of our study showed that access to the pharmacist profession is allowed both to Romanian citizens and to foreigners from the European Union and third countries, as provided, moreover, in the national legislation. The aim was to provide an image of the evolution of the number of Romanian and foreign pharmacists practising in Romania, as well as forecast models of future trends (in the next five years).

The downward trend observed at the beginning of the COVID pandemic continues in the following periods. Our country also attracts foreign pharmacists who want a better standard of living and choose to practice either temporarily (to gain experience and knowledge before migrating to better-developed states) or permanently by settling in Romania.

However, the attractiveness of the pharmacist profession has decreased in Romania, compared to other medical professions, due to the lack of better working conditions and salaries that allow professional development, career opportunities and workforce stability. The number of students enrolling in the Faculties of Pharmacy has decreased significantly in recent years and is forecast to continue downward in the coming years.

Foreign pharmacists who enrol in the College of Pharmacists come mainly from Asia and Africa and choose to work mainly in the more developed regions (Bucharest-Ilfov and West), generally in chain community pharmacies.

The tendency to reduce the number of pharmacists can be stopped by adapting training to the current requirements of the European labour market in the health field, diversifying the specializations of the pharmacists, the services that can be offered to patients, and remuneration according to performance, skills and abilities. Through the added value brought to the medical act, the pharmacist can be recognized as an indispensable professional in the health care team regardless of the field of activity: pharmacy, research, clinical studies, pharmaco-economic analyses, public health, production, distribution and administration. The legal framework is well-defined in Romania regarding the access and development of pharmaceutical activities. However, decision-makers could intervene to find the best solutions necessary to obtain the performance of human resources in the pharmaceutical field and indispensable professionals in the health field.

Conflict of interest

The authors declare no conflict of interest.

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