

MIGRAINE: A PUBLIC HEALTH ISSUE

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Migraine is a common neurological condition with a significant impact on quality of life and productivity. In Romania, the prevalence is estimated at 12–15% of the adult population, indicating a major public health issue. This study analyzes the distribution, risk factors, socio-economic impact, and systemic issues associated with migraine in Romania.

Keywords: Migraine, quality of life, female gender, genetic transmission.

CONTEXT / INTRODUCTION

A migraine is a distinct type of headache with specific characteristics that occurs more frequently in young women; it can significantly impact quality of life and hinder the performance of daily activities. Some individuals need to stay in bed for several days until the migraine passes. Migraine attacks tend to worsen over time, although for most people, the condition may improve after many years.

The World Health Organization (WHO) classifies migraine as one of the top 10 causes of disability worldwide; it is a chronic, recurrent neurological condition that causes intense—often unilateral and pulsating—headaches, accompanied by nausea, vomiting, and sensitivity to light or sound. [1]

What is a migraine?

A migraine is not merely a headache but a complex neurological disorder involving neurovascular mechanisms. It can occur at any age but is more common in women, suggesting that hormonal fluctuations play a significant role.

The exact cause underlying the onset of migraines has not been established, though several theories suggest the condition is primarily a neurological dysfunction. Another theory posits that migraines may result from the release of serotonin—which exerts a vasoconstrictive effect on cerebral circulation—with women being more frequently affected due to a higher number of hormonal receptors compared to men. Increased excitability of the cerebral cortex and an inability to control nociceptive neurons located in the trigeminal nucleus may represent a third cause of migraines. [2]

Studies conducted to date indicate a possible genetic transmission of the condition; the risk of developing the disease is significantly higher among first-degree relatives of affected patients, and twin studies suggest a heritability estimate of 30% to 60%, implying a substantial genetic contribution. A family history of the disease is present in at least two-thirds of sufferers, with familial hemiplegic migraine being caused by autosomal dominant mutations in four distinct genes (three involved in ion transport and one associated with the exocytosis complex). [3]

Trigger factors include post-traumatic stress, emotional stress, sleep disturbances, fatigue, hunger, certain foods

(chocolate, aged cheeses, alcohol), physiological hormonal fluctuations (menarche, pregnancy, perimenopause, or menopause), exposure to bright light or loud noise, and dehydration.

According to the International Headache Society (ICHD-3) classification, migraines can be differentiated based on the presence of aura and clinical and genetic characteristics, as follows:

⇒ *Common (polygenic) migraine:* Most forms of migraine are considered complex polygenic disorders, in which multiple genetic variants contribute to susceptibility. Genome-wide association studies (GWAS) have identified numerous migraine-associated loci involved in:

- regulation of vascular tone,
- glutamatergic neurotransmission,
- ionic homeostasis,
- synaptic function. These findings support the neurovascular model of migraine, in which the interaction between neurons and cerebral blood vessels plays an essential role.

⇒ *Familial hemiplegic migraine (monogenic)* Familial hemiplegic migraine (FHM) is a rare but genetically well-characterized form of migraine; it is a monogenic disorder with autosomal dominant inheritance. It is associated with mutations in genes encoding proteins involved in neuronal ion transport:

- CACNA1A (voltage-gated calcium channels),
- ATP1A2 (Na⁺/K⁺-ATPase pump),
- SCN1A (sodium channels).

These mutations cause alterations in neuronal excitability and facilitate the occurrence of cortical spreading depression, providing an important experimental model for understanding the mechanisms of migraine.[4]

⇒ *Migraine with aura* – specific warning signs occur just before the onset of the migraine, such as flashes of light;

⇒ *Migraine without aura* – the most common type, where the migraine occurs without specific warning signs;

⇒ *Migraine with aura without headache*, known as silent migraine – aura or other migraine symptoms are experienced, but the headache does not occur.

A migraine episode typically lasts between 4 and 72 hours and unfolds in several phases:

- Prodrome – may occur 24–48 hours beforehand and includes fatigue, irritability, and increased food cravings;
- Aura (in some cases) – reversible neurological symptoms;
- Pain phase – throbbing, unilateral pain aggravated by physical activity;
- Postdrome – a state of exhaustion and difficulty concentrating.

Some people experience frequent migraines—up to several a week—while others have them only occasionally. Several years may even elapse between migraine attacks.

How do we recognize a migraine?

A migraine can cause throbbing pain, usually on one side of the head. It is frequently accompanied by nausea, vomiting, and extreme sensitivity to light and sound. Migraine attacks can last from a few hours to several days, and the pain can be severe enough to interfere with your daily activities.

For some people, a warning symptom known as an "aura" occurs before or alongside the headache. An aura may involve visual disturbances, numbness in half of the face, arm, or leg, or speech difficulties.

International studies show that migraine is one of the most widespread neurological disorders worldwide:

Analyses based on studies from dozens of countries estimate the global prevalence of migraine in the adult population to be approximately 14–15%, meaning that about 1 in 7 people suffers from it in any given year. [5]

Migraine contributes substantially to the global burden of disease, accounting for nearly 5% of total years lived with disability (YLD) worldwide.

Other epidemiological data indicate that migraine prevalence and disease burden remain high across all geographic and socioeconomic levels, with variations between regions and sexes.

Some local or regional studies have confirmed these global trends:

In China, a systematic review and meta-analysis of data collected between 1988 and 2023 showed that migraine prevalence has increased significantly over time, reaching an average of ~7% in recent periods. Additionally, migraine is more common in women than in men. [6]

The prevalence of migraine in Romania is 12–15% of the adult population—approximately 2–3 million people suffer from the condition—a figure similar to the European average (~14%) [7].

In Romania, migraine without aura is the most common type; a significant proportion of patients suffer from chronic forms (≥ 15 days/month), indicating delayed diagnosis or inadequate treatment.

Data concerning young people and young adults (aged 15–39) indicate an increase in the prevalence and burden

of migraine over recent decades, in terms of both new cases and the impact on years lived with disability [8].

METHODOLOGY:

This is a descriptive, retrospective study based on data reported by Romanian hospitals and included in the National DRG Database.

The study included all continuous hospitalizations between 2017 and 2024 reported by Romanian hospitals under contract with the National Health Insurance House.

In accordance with the provisions of Ministry of Health Order no. 1782/576/2006 regarding the statistical registration and reporting of patients receiving continuous and day-hospitalization medical services—including subsequent amendments and supplements—the INMSS collects and processes the minimum patient-level dataset for cases treated under continuous and day-hospitalization regimes.

Data were selected using the ICD-10-AM classification, and hospitalizations were grouped using the Romanian RODRGv1.1 grouper. Records from patient medical charts were extracted and analyzed, then assigned to one of the three corresponding DRG codes:

• Migraine G43

In accordance with the provisions of Law 190/2018 and Article 13 of EU Regulation 679/2016, personal data are deleted upon transmission to the INMSS, and the identification of individuals for analysis purposes is based on the encrypted Personal Identification Number (CNP).

Patient age was calculated in completed years as the difference between the date of admission and the date of birth.

Data were processed using SQL Server Management Studio Express 2005 software, while subsequent processing and analysis were performed using SPSS and Excel. The analysis was conducted based on a series of demographic and socioeconomic variables—such as age, length of hospital stay, discharge status, etc.—included in the minimum dataset reported by hospitals within the DRG system. The findings were interpreted and presented in the form of tables and graphs.

Throughout the 2017–2025 period, the rate of continuous hospitalization remains consistently higher among women than among men. For women, the figures drop from 3,619 cases in 2017 to 2,677 in 2025, with a sharper decline in 2020 followed by a partial recovery. Among men, the number of cases falls from 1,930 in 2017 to 910 in 2025, reaching a low of 938 in 2020. Overall, the data indicate a decline in continuous hospitalization for both sexes, yet the predominance of women persists throughout the analyzed period. Chart No. 1

Between 2017 and 2025, day-hospitalization trends differed by gender. Among women, the number of cases rose from 1,422 in 2017 to 2,211 in 2025, despite a temporary dip in 2020 and a steady increase thereafter. Among men, an overall downward trend was observed, with cases falling from 909 in 2017 to 549 in 2025. Consequently, the data highlight an increasingly pronounced female predominance in day-hospitalization, with a significant gender gap in recent years. Chart No. 2

Chart No. 1: Gender distribution of continuous hospitalization episodes (SC) for migraine reported by hospitals in Romania, 2017–2025

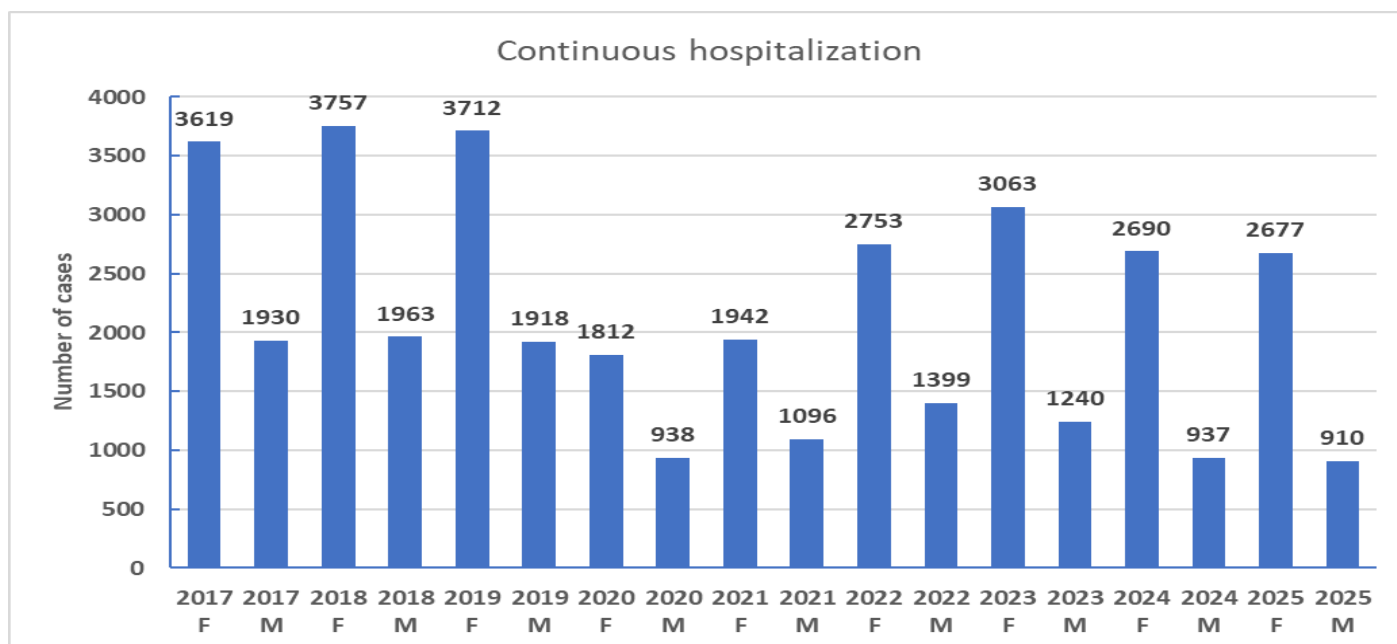
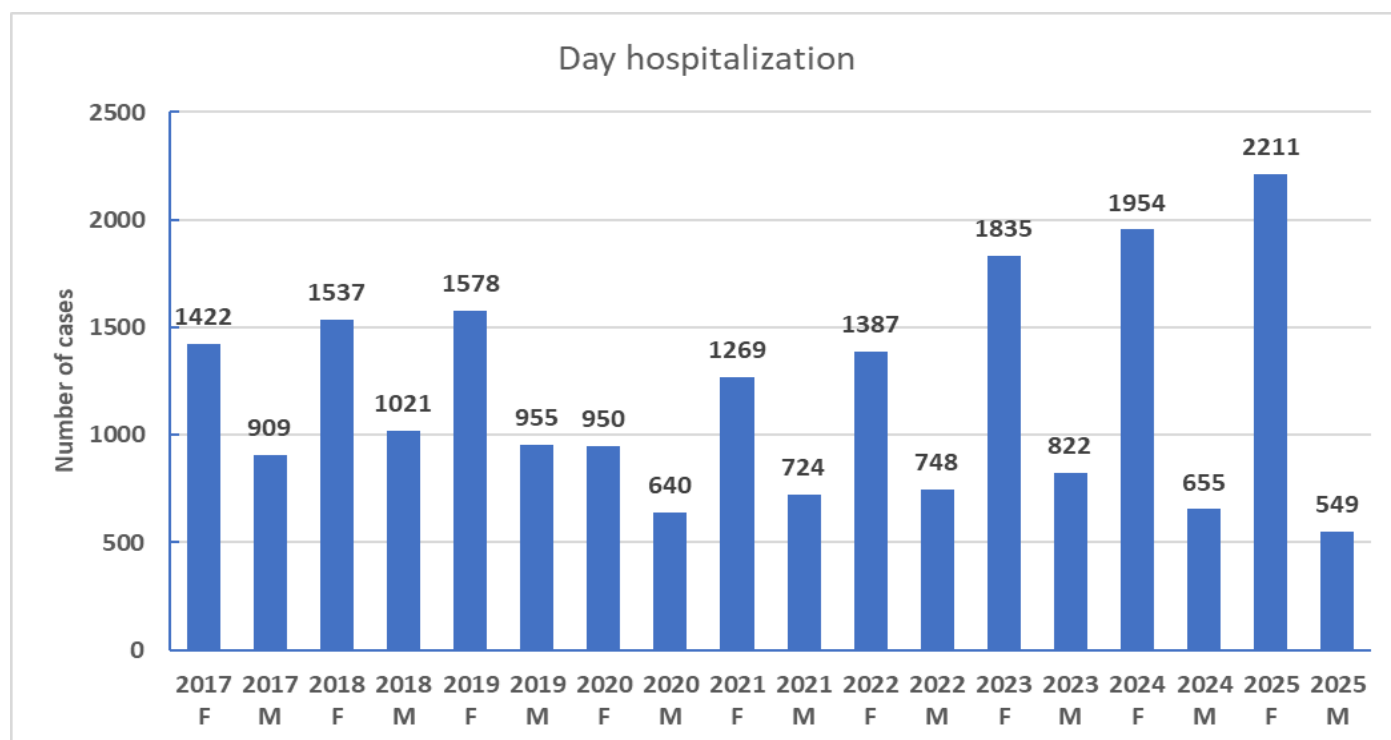


Chart No. 2: Gender distribution of day-hospitalization (DH) episodes for migraine reported by hospitals in Romania, 2017–2025



The data also reveal a consistent predominance of women in both day-hospitalization and continuous hospitalization throughout the 2017–2025 period. A decline in continuous hospitalization and a rise in day-hospitalization are observed, particularly among women. These results indicate gender-based differences in the utilization of hospital services, with higher service uptake among women. Chart No. 1 and Chart No. 2

The distribution by age group highlights a concentration of cases predominantly within the adult population, with particularly high figures in the 40–59 age range, although the distribution varies depending on the year analyzed and the clinical form of the migraine. A marked decrease in the number of episodes across all age groups is observed in 2020, followed by a partial recovery.

Chart No. 3: Continuous hospitalization (CH) – distribution by age and migraine type, 2017

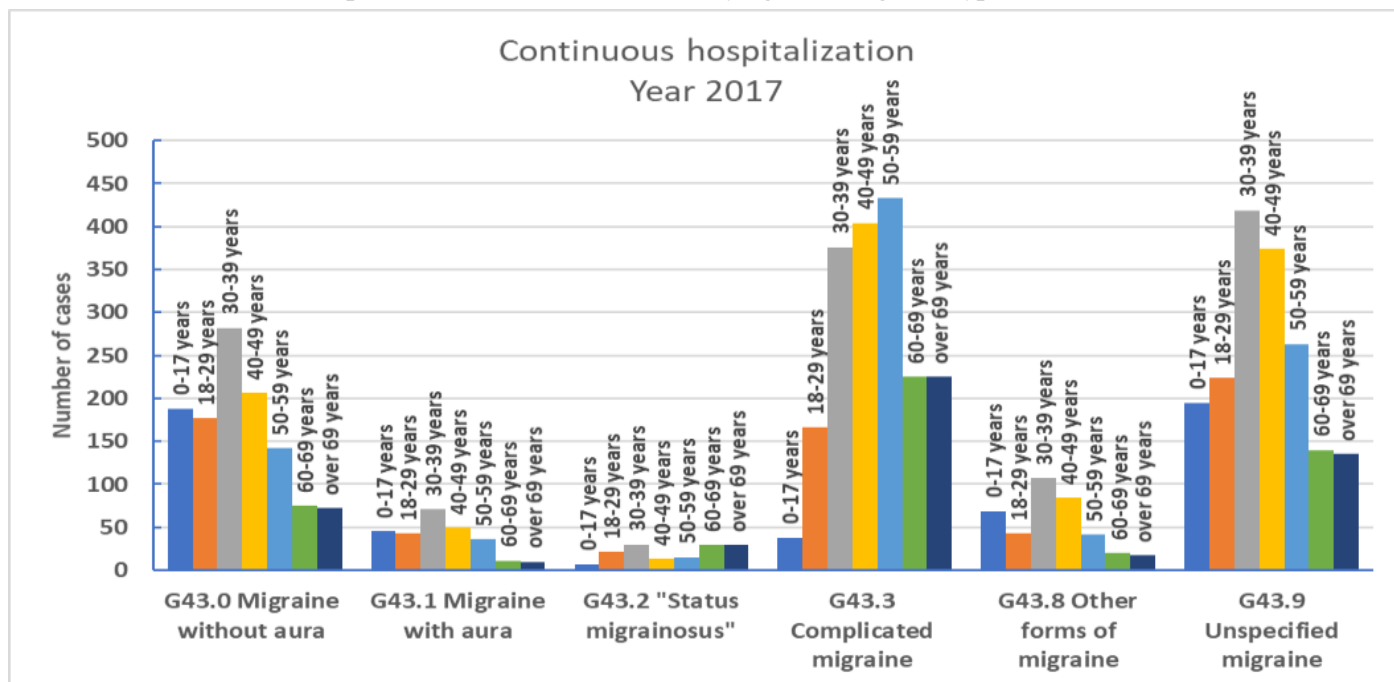
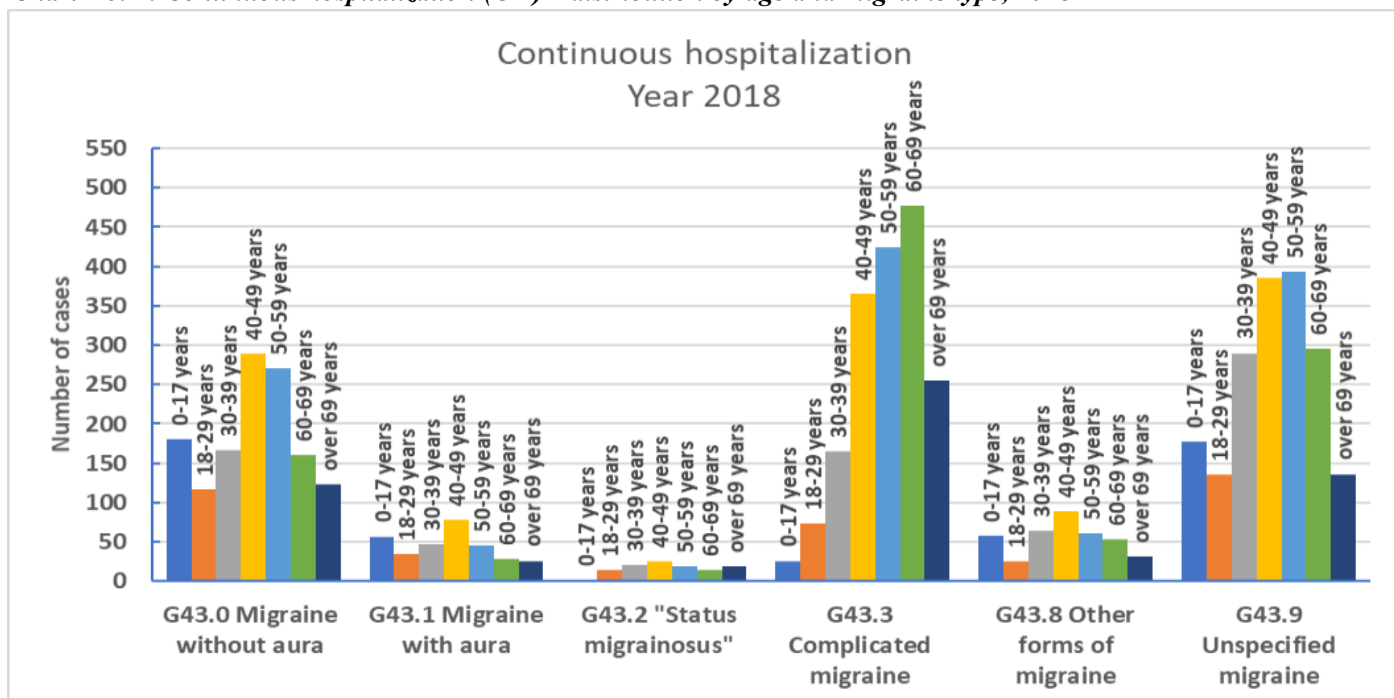


Chart No. 4: Continuous hospitalization (CH) – distribution by age and migraine type, 2018



Migraine without aura (G43.0) is present across all age groups, with higher figures among adults. Migraine with aura (G43.1) also shows a distribution predominantly among adults.

A distinct trend is observed for complicated migraine (G43.3). In the first part of the analyzed period, it records a high number of cases, concentrated mainly in the 40–69 age groups. Subsequently, the number of episodes drops considerably, falling from 1,867 cases in 2017 to 231 in 2025.

Unspecified migraine (G43.9) shows a broad distribution across age groups and remains one of the most frequently reported diagnostic categories. In 2025, 1,451 cases were recorded, with the majority concentrated in the 40–49 and 50–59 age groups. Compared to the other forms analyzed, *status migrainosus* (G43.2) records a low number of cases throughout the period. Overall, data on continuous hospitalization indicate both a reduction in the total number of episodes compared to the beginning of the analyzed period and changes in their composition based on the reported diagnosis (Chart 3-11).

Chart No. 5: Continuous hospitalization (CH) – distribution by age and migraine type, 2019

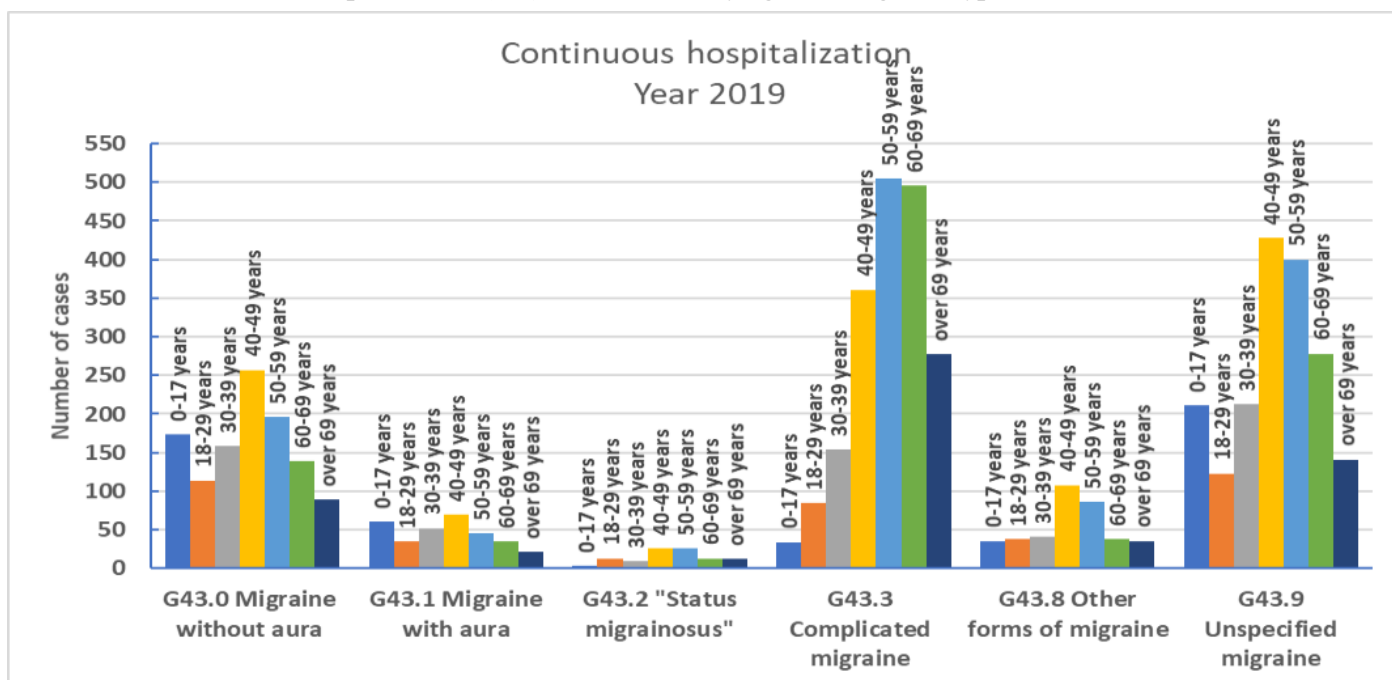
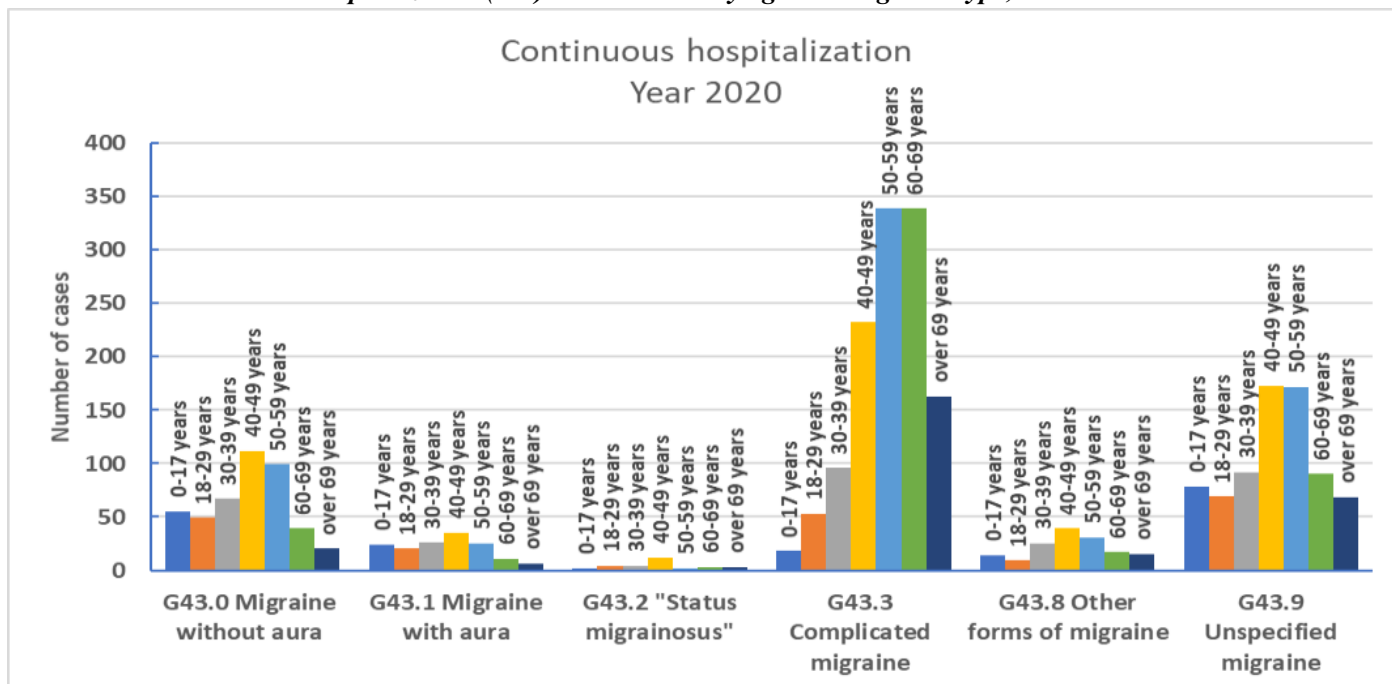


Chart No. 6: Continuous hospitalization (CH) – distribution by age and migraine type, 2020



Regarding day hospitalization, episodes are predominantly concentrated in adult age groups, particularly among individuals aged 40 to 59. Under this hospitalization model, a significant reduction in the number of cases is also observed in 2020, followed by an increase in subsequent years.

Migraine without aura (G43.0) shows a clear increase during the final years of the analyzed period. The number of cases rises from 421 in 2017 to 910 in 2025. In 2025, the highest number of cases is recorded in the 40–49 age group (318 cases), followed by the 30–39 age group (217 cases) and the 50–59 age group (160 cases).

Migraine with aura (G43.1) is predominantly found in young and middle-aged adults; in recent years, the highest figures have been recorded primarily in the 30–39 and 40–49 age groups.

Complicated migraine (G43.3) shows a downward trend. The number of episodes drops from 688 in 2017 to 157 in 2025. During the first part of the analyzed period, cases were concentrated mainly in the 50–59 and 60–69 age groups.

Unspecified migraine (G43.9) remains one of the most frequently reported diagnostic categories

Chart No. 7: Continuous hospitalization (CH) – distribution by age and migraine type, 2021

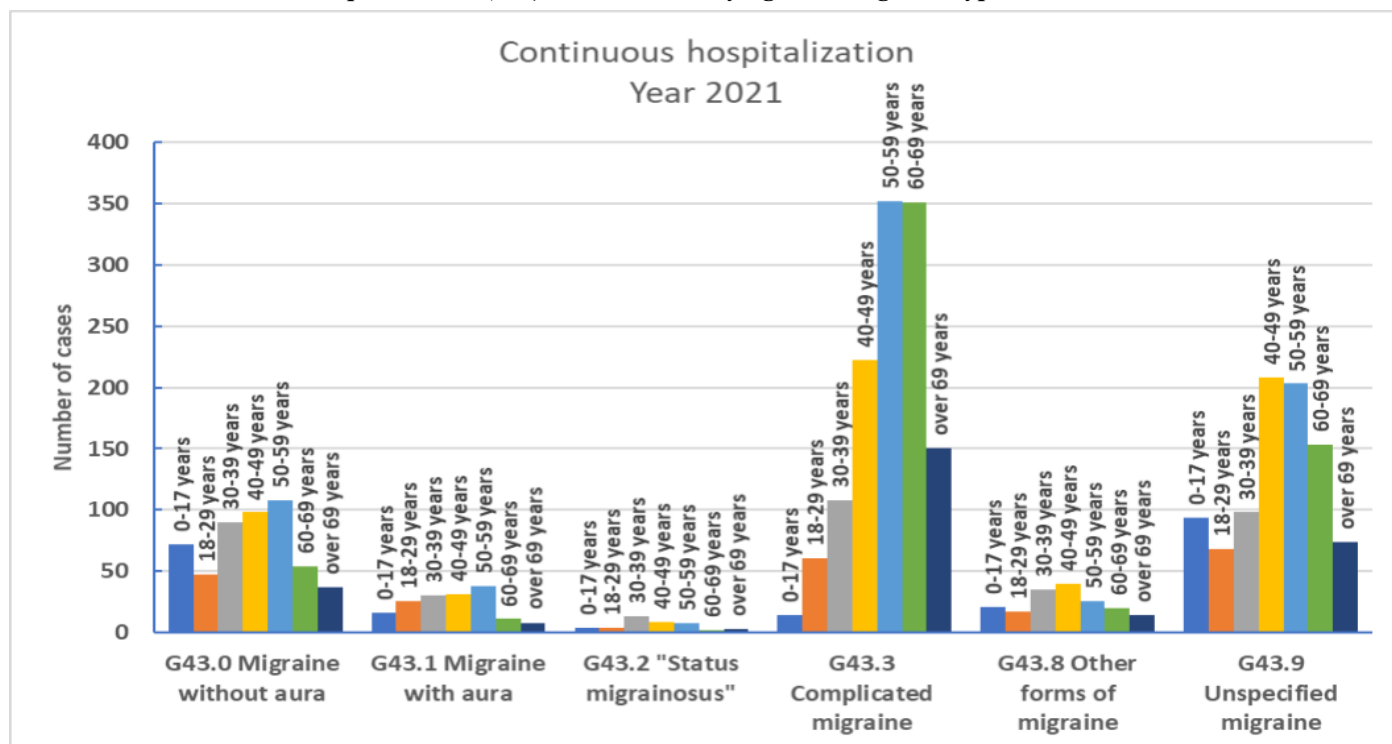
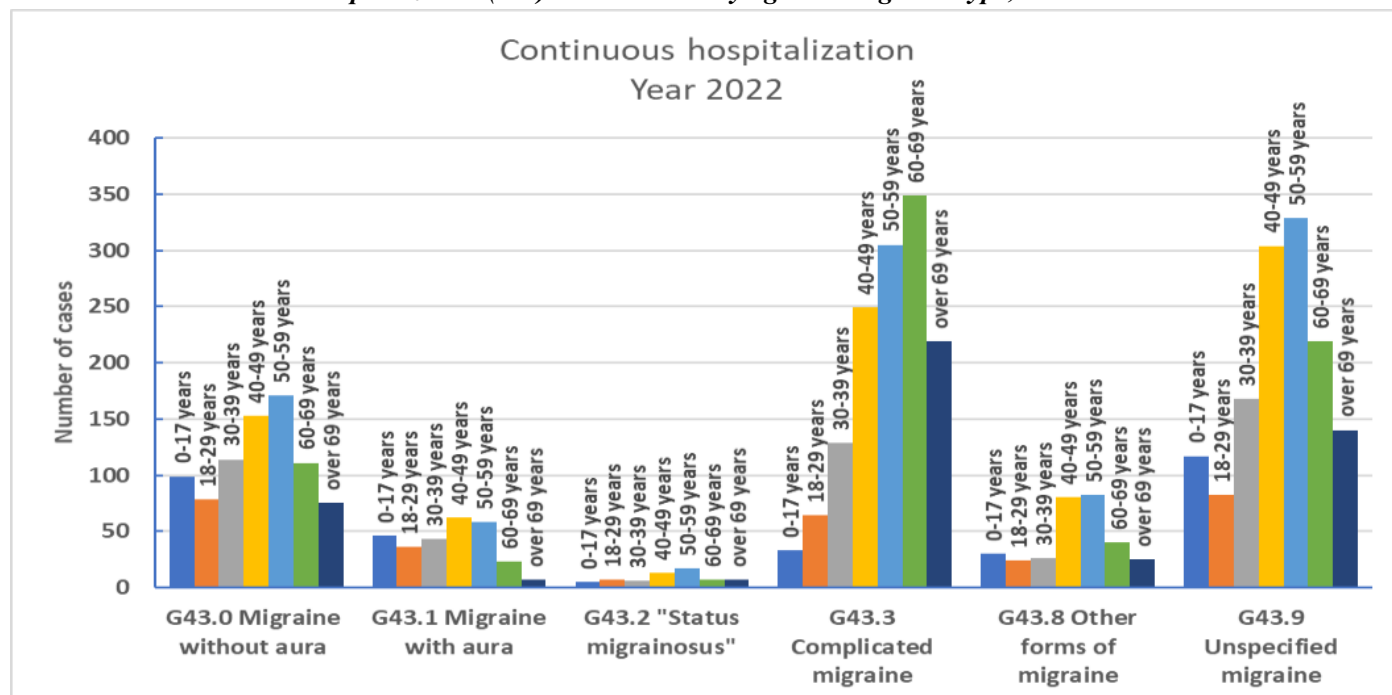


Chart No. 8: Continuous hospitalization (CH) – distribution by age and migraine type, 2022



in day-case hospitalization. In 2025, 1,034 cases were recorded, with the highest numbers in the 40–49 (317 cases) and 50–59 (252 cases) age groups. Other forms of migraine (G43.8) show lower figures, while *status migrainosus* (G43.2) remains rarely reported. Chart 12-20

A comparative analysis of continuous hospitalization versus day-case hospitalization highlights differing trends between the two care settings. Overall, continuous hospitalization shows a downward trend, whereas day-case

hospitalization exhibits a more pronounced recovery following the decline seen in 2020. In both settings, cases are concentrated primarily among adults, particularly in the 40–59 age range.

At the same time, changes in the diagnostic structure are evident. Unspecified migraine (G43.9) remains one of the most frequently reported categories, while migraine without aura (G43.0) has shown a more marked increase in recent years, especially in day-case hospitalization.

Chart No. 9: Continuous hospitalization (CH) – distribution by age and migraine type, 2023

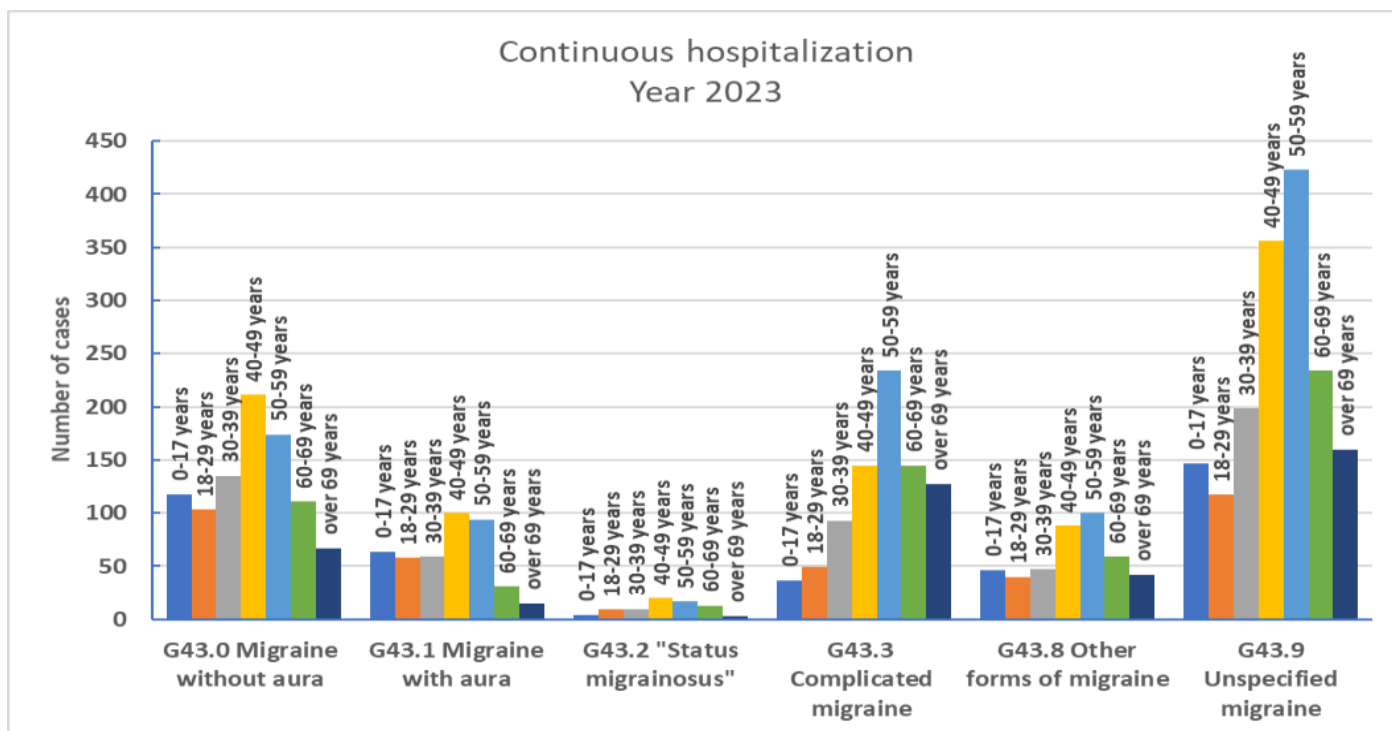
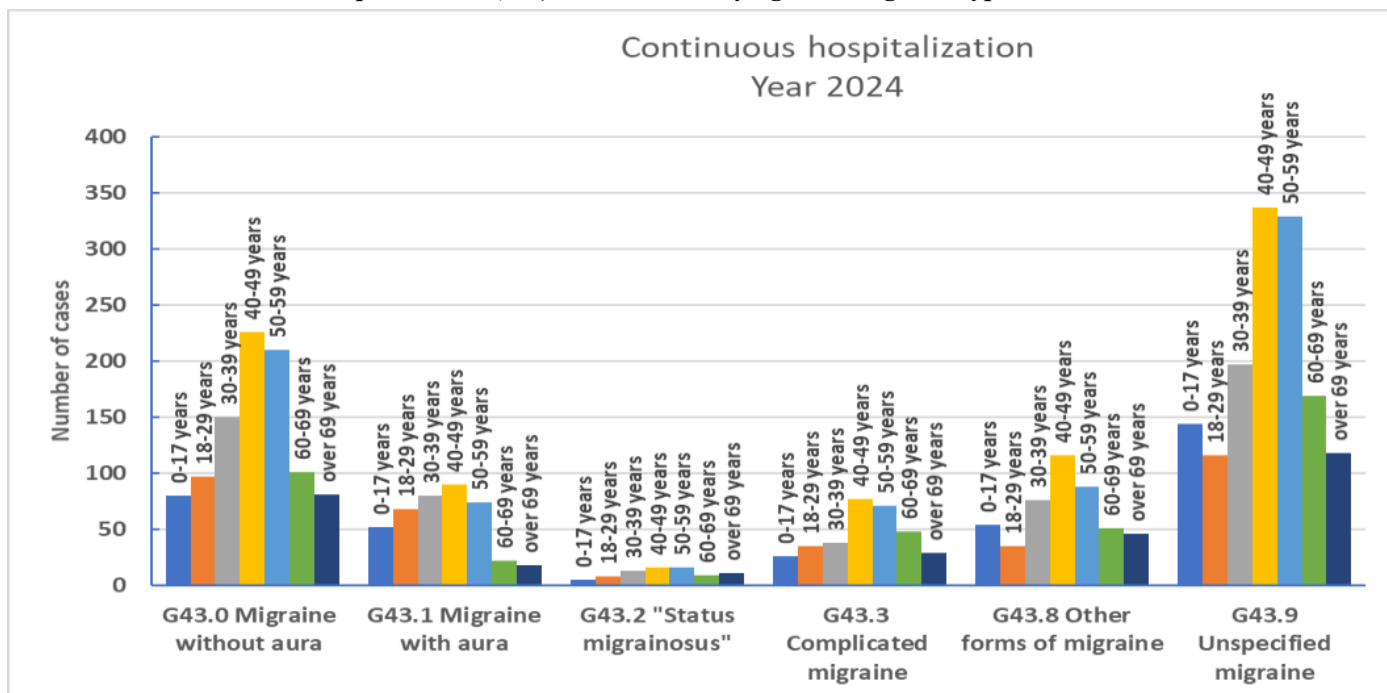


Chart No. 10: Continuous hospitalization (CH) – distribution by age and migraine type, 2024



Conversely, the number of cases classified as complicated migraine (G43.3) is decreasing significantly in both hospitalization settings.

The results describe changes over time in the volume and structure of hospitalizations for migraine. Since the analysis is based on the absolute number of episodes reported by hospitals, these figures cannot be interpreted as measures of migraine incidence or prevalence, nor do they allow for the determination of the causes behind the observed changes.

DISCUSSION:

The study results highlight significant changes in migraine-related hospitalizations reported in Romania between 2017 and 2025, regarding both their volume and their distribution by sex, age, migraine type, and hospitalization regimen.

The predominance of women among hospitalized cases aligns with international epidemiological

Chart No. 11: Continuous hospitalization (CH) – distribution by age and migraine type, 2025

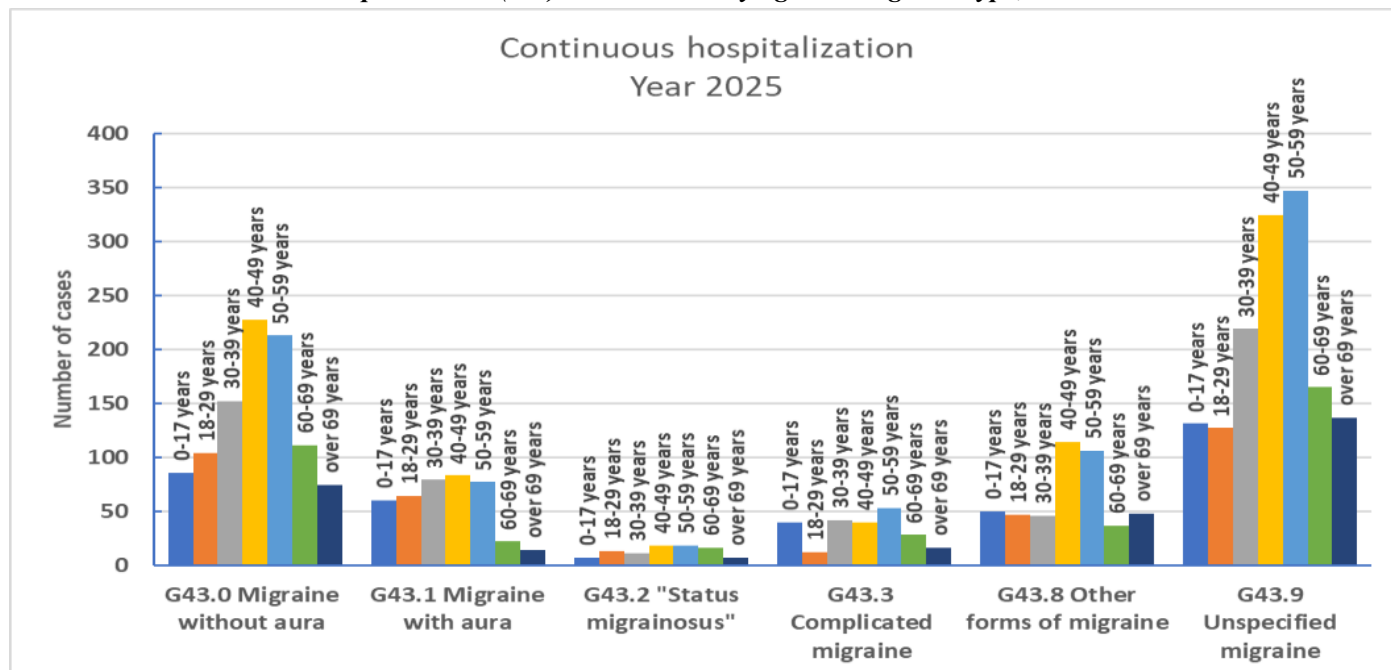
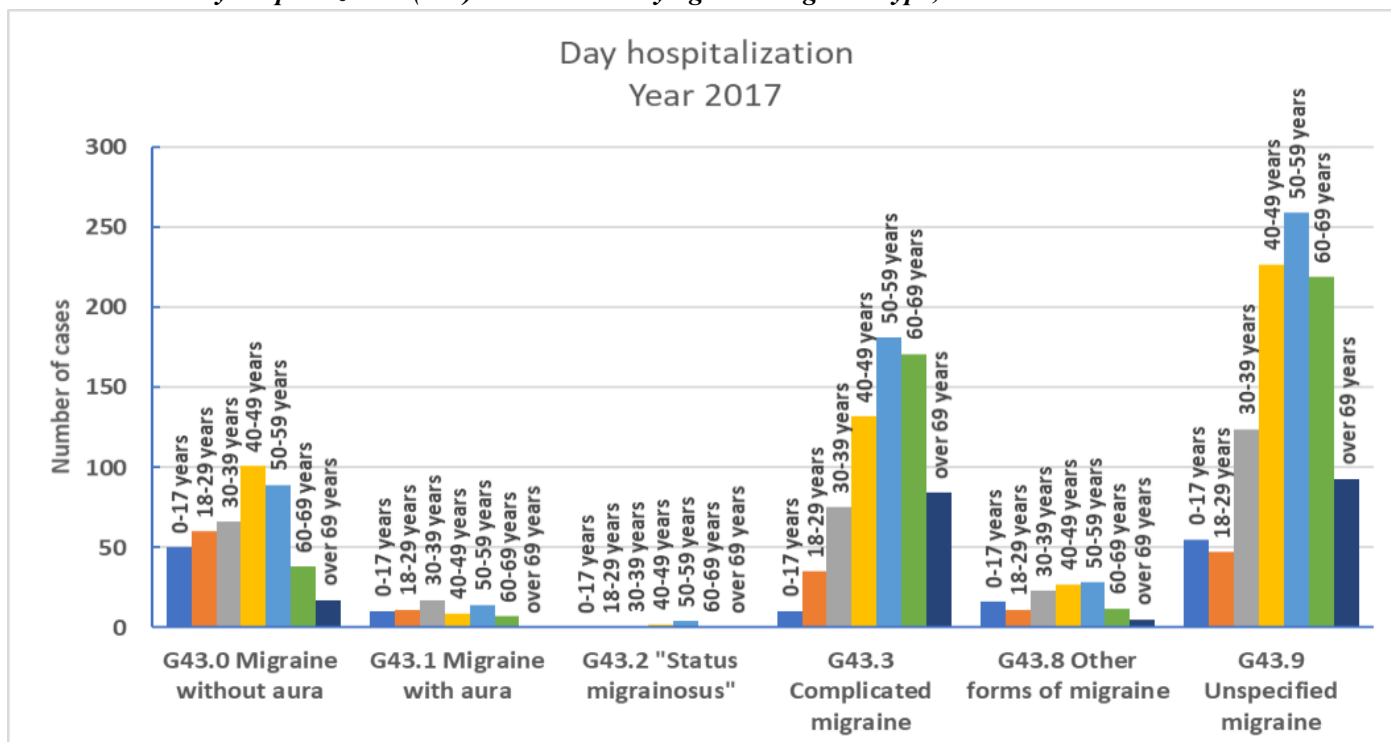


Chart No. 12: Day hospitalization (DH) – distribution by age and migraine type, 2017



data, which indicate a migraine prevalence approximately two to three times higher in women than in men. These differences are attributed to a combination of biological and hormonal factors, alongside specific characteristics regarding clinical manifestations and healthcare service utilization. However, the results of the present study do not allow for the differentiation of these factors' specific contributions and should be interpreted as a description of the reported hospitalization episodes.

The distribution by age group shows that hospitalizations are concentrated predominantly within the adult population, particularly in the 40–49 and 50–59 age groups. This distribution is significant from a public health perspective, as it largely affects the working-age population. Nevertheless, in the absence of data regarding the number of cases relative to the population size of each age group, the results cannot be interpreted as reflecting differences in incidence or prevalence between the analyzed groups.

Chart No. 13: Day hospitalization (DH) – distribution by age and migraine type, 2018

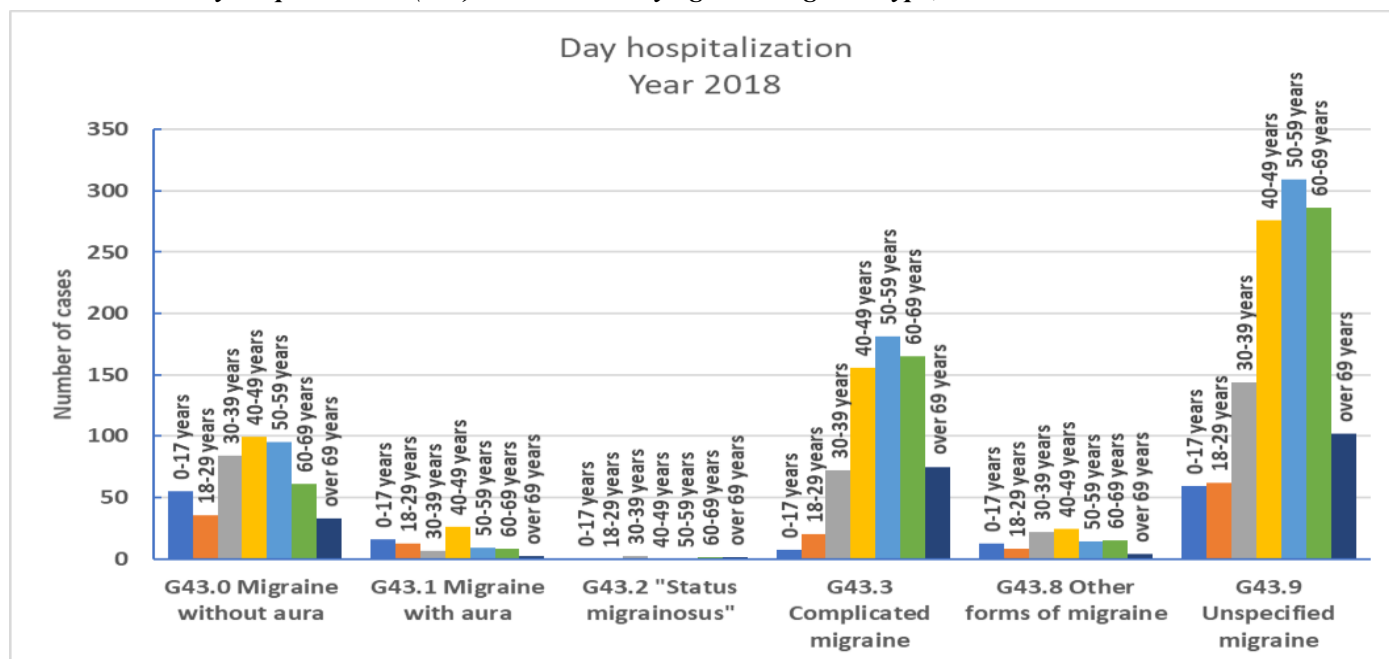
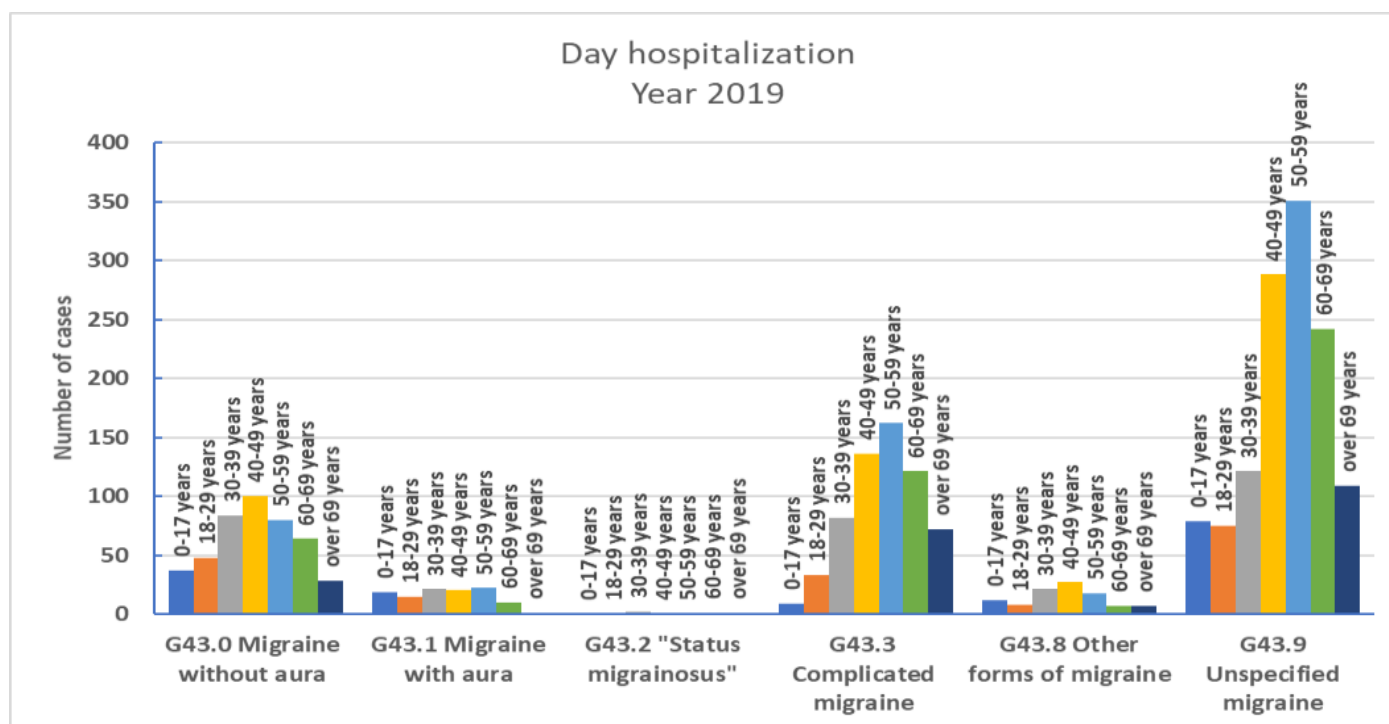


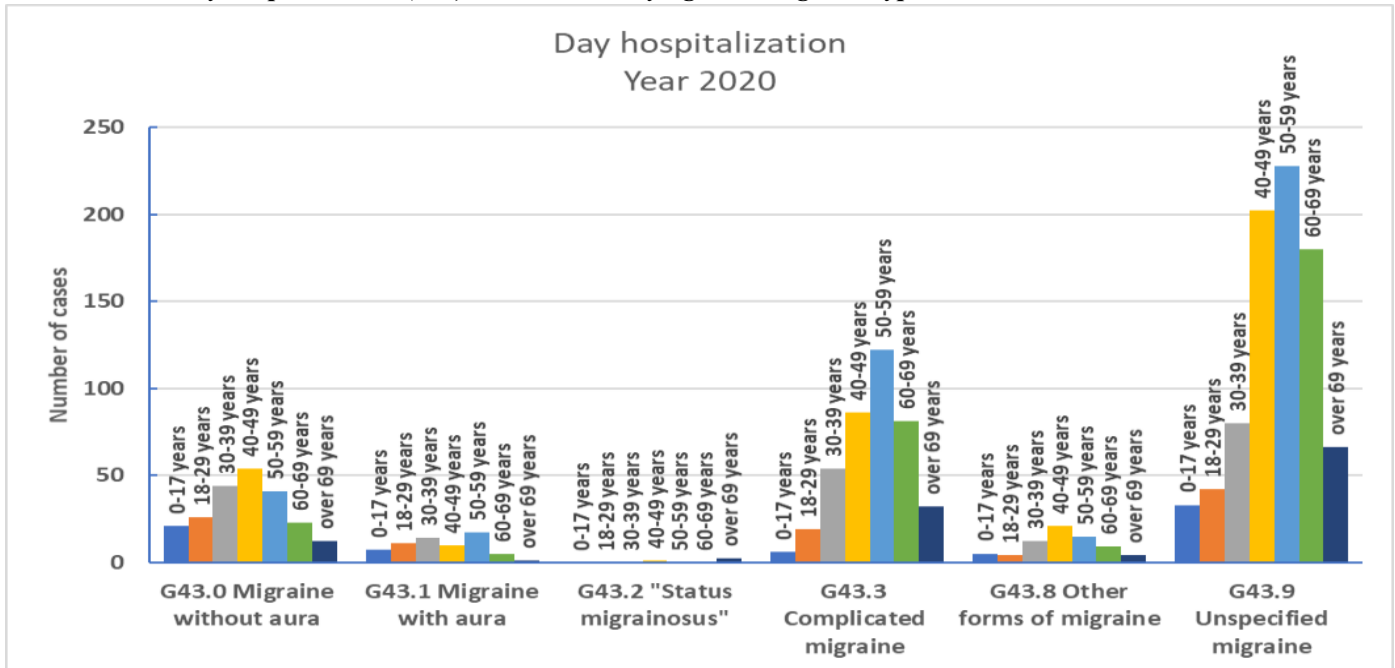
Chart No. 14: Day hospitalization (DH) – distribution by age and migraine type, 2019



A notable feature of the time series is the significant reduction in the number of hospitalizations in 2020, observed across both inpatient and day-case settings and within most age groups. This trend coincides with the COVID-19 pandemic, a period characterized by major changes in access to and utilization of medical services. As the study did not analyze the determinants of service utilization, a causal link between the pandemic context and the observed decline cannot be established.

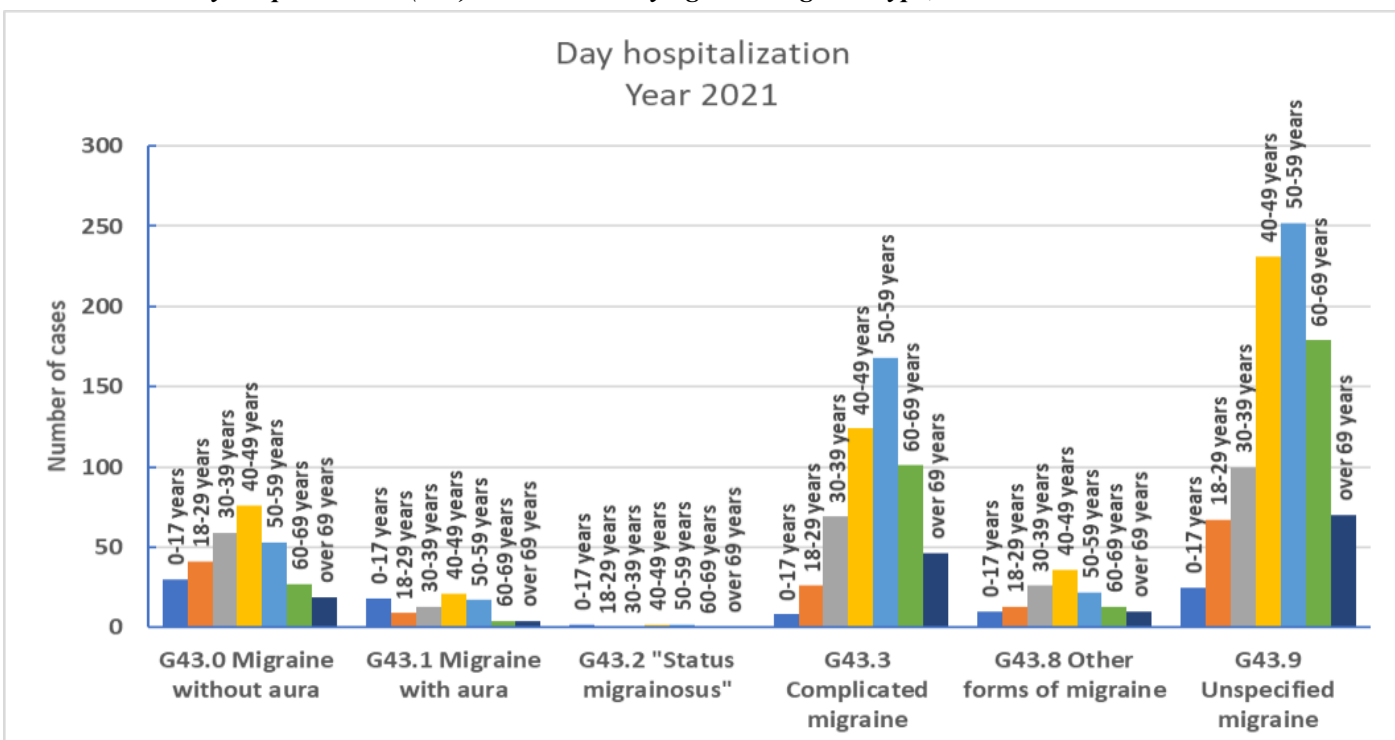
A comparison of the two hospitalization settings reveals a decrease in inpatient admissions over the analyzed period, contrasting with a different trend for day-case hospitalizations, which showed a clear increase in recent years—particularly among women. These trends may reflect changes in the delivery and utilization of hospital services for migraine patients. However, the available data do not allow for the demonstration of a direct shift of cases from inpatient to day-case care; this hypothesis requires further analysis.

Chart No. 15: Day hospitalization (DH) – distribution by age and migraine type, 2020



However, identifying the mechanisms underlying these

Chart No. 16: Day hospitalization (DH) – distribution by age and migraine type, 2021



Another significant finding is the shift in the diagnostic structure of hospitalized cases. Unspecified migraine (G43.9) remains one of the frequently reported categories, whereas migraine without aura (G43.0) shows an increase, which is more pronounced in day-case hospitalizations. Concurrently, a considerable reduction is observed in the number of cases reported as complicated migraine (G43.3), in both inpatient and day-case settings. These changes may reflect shifts in the composition of treated cases, as well as

trends goes beyond the scope of a descriptive analysis based on administrative data.

The significant proportion of cases classified as unspecified migraine is also an aspect worthy of further investigation. A more detailed analysis of coding practices and the clinical characteristics of these cases could contribute to a better understanding of the observed diagnostic structure.

The study's main limitation stems from the use of an administrative hospital database. The data reflect episodes

Chart No. 17: Day hospitalization (DH) – distribution by age and migraine type, 2022

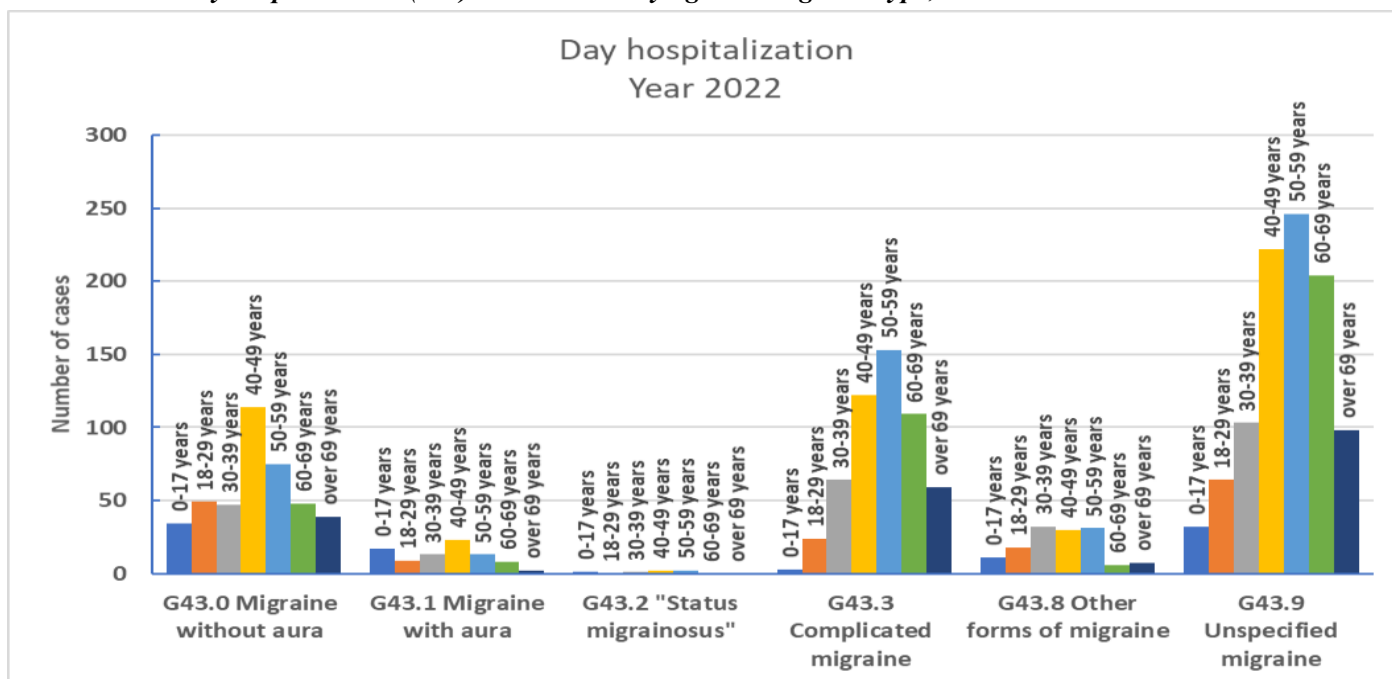
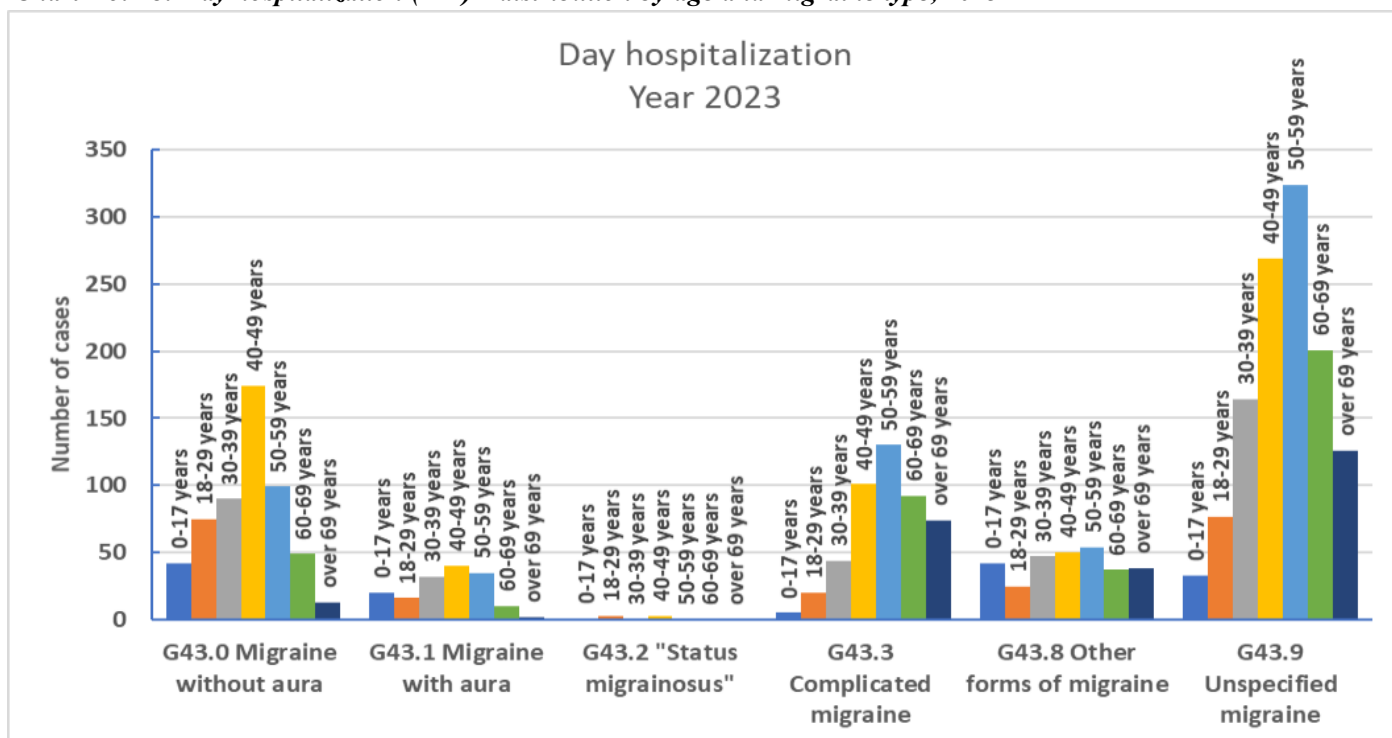


Chart No. 18: Day hospitalization (DH) – distribution by age and migraine type, 2023



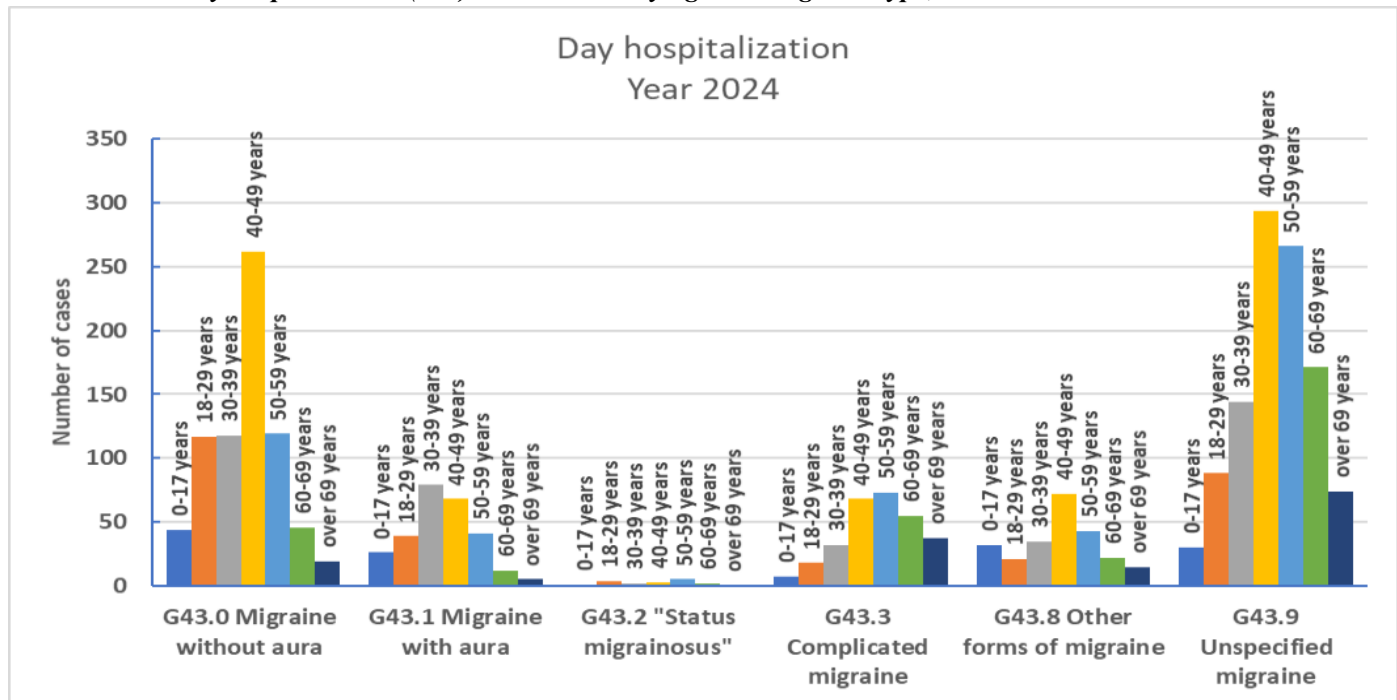
reported by healthcare facilities rather than the total population of individuals with migraine. Consequently...

The female predominance is strongly supported by the literature: an analysis in **The Lancet Neurology** reports a two- to threefold higher prevalence among women and describes differences regarding duration, recurrence, and disability. A review and consensus statement by the European Headache Federation, published as recently as 2026, confirm the persistence of a substantially higher burden among women and the probable role of hormonal factors.

CONCLUSIONS:

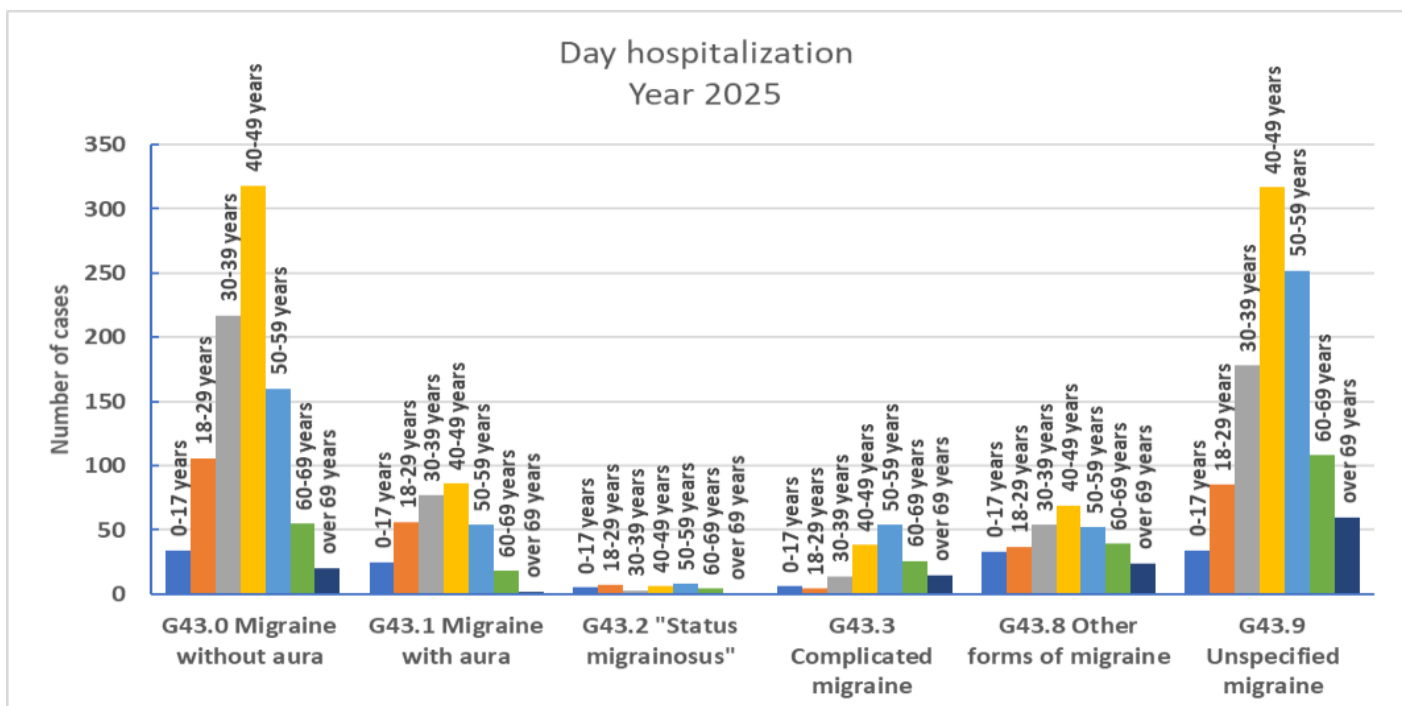
An analysis of epidemiological data and specialized literature identifies migraine as a major neurological condition within the context of public health in Romania, characterized by high prevalence and a significant impact on individual functioning and socio-economic well-being. Current estimates indicate that this condition affects a substantial percentage of the adult population, aligning with trends observed at both European and global levels.

Chart No. 19: Day hospitalization (DH) – distribution by age and migraine type, 2024



gical services and innovative therapies. Disparities in the

Chart No. 20: Day hospitalization (DH) – distribution by age and migraine type, 2025



The distribution of migraine by sex and age highlights a predominant impact on the working-age population—particularly women—entailing direct repercussions for labor productivity and associated indirect costs. From this perspective, migraine must be addressed not merely as an individual clinical issue but also as a significant factor influencing economic performance and the sustainability of the healthcare system.

At the same time, the analysis reveals systemic healthcare shortcomings, specifically limited access to neurolo-

distribution of medical resources and financial barriers contribute to suboptimal disease management. Furthermore, low levels of health literacy among the general population lead to misconceptions about migraine, delaying diagnosis and the initiation of appropriate treatment.

In this context, adopting an integrated, multidisciplinary approach to migraine management in Romania is essential. This should entail the development of public policies focused on prevention, early diagnosis, and personalized treatment, alongside the implementation of national

information and education programs. Additionally, strengthening the role of family physicians is crucial for the early identification of cases and for facilitating patient access to specialized services. In conclusion, migraine remains an underestimated condition, yet one with major implications for public health and the socio-economic system. The absence of effective systemic interventions risks perpetuating the negative impact of this condition, underscoring the need for coherent and sustainable strategic measures at the national level.

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