

USE OF HOSPITAL SERVICES FOR F40–F48 DISORDERS IN ROMANIA: TRENDS, TERRITORIAL DISTRIBUTION AND ADMISSION PATTERNS (2016–2025)

Marius CIUTAN¹, MD, Specialist in Public Health and Management (SPM)

Carmen SASU¹, MD, Specialist in Public Health and Management (SPM)

¹National Institute of Health Services Management

INTRODUCTION

According to the World Health Organization (WHO), anxiety disorders are among the most common mental health conditions globally, affecting approximately 4.4% of the world's population—over 359 million people in 2021, including children and adolescents—and represent one of the leading causes of mental disability across all ages [1].

Prolonged exposure to psychosocial stress—arising from family or occupational burden, traumatic events, socio-economic instability or everyday pressures—is a major trigger in the pathogenesis of disorders within the F40–F48 spectrum. Chronic stress disrupts neuroendocrine regulation by affecting the hypothalamic–pituitary–adrenal axis, leading to increased cortisol levels and sustaining anxiety, hyper-vigilance and cognitive impairment. In addition, persistent stress is associated with significant functional consequences, such as concentration difficulties, sleep disturbances, reduced work performance and impaired interpersonal relationships [2].

At the population level, chronic stress may contribute to increasing the incidence and prevalence of anxiety and adjustment disorders, which translates into a growing burden on public health, medical services and national economies. Although effective treatments exist, a substantial proportion of affected individuals do not receive adequate care due to limited specialised resources, stigma and unequal access to mental health services [1].

In the context of modern health policy, analysing hospitalisations for F40–F48 disorders using administrative data (Diagnosis-Related Groups—DRG) becomes essential for understanding resource utilisation, optimising clinical management and planning mental health services. Assessing distributions by diagnostic codes, average length of stay, case-mix index and admission-related costs can provide critical evidence for effective national interventions.

Neurotic, stress-related and somatoform disorders (ICD-10 F40–F48) are a heterogeneous group of mental health conditions characterised by anxiety, reactions to stress, medically unexplained somatic symptoms and psychological dysfunction linked to psychosocial stress. This category includes phobic anxiety disorders (F40), other anxiety disorders (F41), obsessive-compulsive disorder (F42),

INTRODUCTION. Neurotic, stress-related and somatoform disorders (ICD-10 F40–F48) represent an important group of mental health conditions associated with psychosocial stress and significant functional impairment. Analysing hospital service utilisation for these diagnoses is essential for understanding the burden on the health system and for informing managerial decisions.

METHODS. A retrospective observational study based on hospital administrative (DRG-type) data for 2016–2025. Episodes with a principal diagnosis within ICD-10 F40–F48 were included and identified by aggregating ICD-10 codes. The analysis used DAX measures in Power Pivot to compute the number of episodes, unique patients and distributions by year, place of residence (urban/rural), sex, county, admission type, diagnosis, length of stay and discharge status.

RESULTS. During the study period, 67,187 hospitalisation episodes with F40–F48 diagnoses were recorded. The temporal trend shows a sharp decline in 2020 (–50% vs 2019), followed by a gradual recovery through 2025. The urban/rural distribution was relatively balanced (53.3% urban; 46.7% rural). Women accounted for 57.6% of episodes. More than half of admissions occurred “without a referral letter” (55.3%), suggesting predominantly direct access. The most frequent diagnoses were F41.2 (mixed anxiety and depressive disorder, ~20.5%) and F43.2 (adjustment disorder, ~11.4%). Most discharges were coded as “improved” (91.8%), and length of stay was predominantly concentrated in short-to-medium intervals.

CONCLUSIONS. Hospital service utilisation for F40–F48 disorders was strongly affected by the pandemic period, followed by a subsequent recovery in admissions. The high proportion of non-referral admissions and marked territorial heterogeneity indicate the need to strengthen outpatient and community mental health services, optimise referral pathways and improve regional resource planning.

Keywords: anxiety disorders, adjustment disorders, OCD, DRG, hospitalisation, mental health, health policy.

reactions to severe stress and adjustment disorders (F43), dissociative (conversion) disorders (F44), somatoform disorders (F45) and other unspecified neurotic disorders (F48). These conditions present with a broad spectrum of affective, cognitive and somatic symptoms that negatively affect individual and social functioning.

METHODS

Study design and data source

We conducted a retrospective, descriptive observational study using hospital administrative (DRG-type) data for 2016–2025. The unit of analysis was the hospitalisation episode (“episode”), identified at the row level within the dataset.

Inclusion criteria

We included episodes with a principal diagnosis within ICD-10 F40–F48 (neurotic, stress-related and somatoform disorders), identified by:

- deriving an ICD3 field = LEFT(CodDiagnostic, 3);
- flagging eligible episodes (FLAG=1) where ICD3 falls between F40 and F48.

Variables analysed

The following variables were analysed:

- time: year (2016–2025), month, quarter;
- demographics: sex, age (varsta), residence (urban/rural);
- geography: county, locality;
- admission pathway: admission type (without referral, GP referral, specialist referral, transfer, etc.);
- diagnosis: ICD-10 code and label, aggregated by subcodes;
- discharge outcome: discharge status (improved, unchanged, cured, worsened, deceased);
- length of stay: DS (distribution in days).

Indicators and analysis

The analysis was performed in SPSS and Excel using Power Pivot (data model) with DAX measures:

- NrEpisoade = COUNTROWS(DRG)
- NrPacienti = DISTINCTCOUNT(IdPacientFisa)
- NrEpisoade_F40_F48 = CALCULATE([NrEpisoade], FLAG=1)
- NrPacienti_F40_F48 = CALCULATE([NrPacienti], FLAG=1)

Frequencies, proportions and distributions were computed by year, residence, sex, county, admission type, diagnosis and discharge status. In the absence of cost/CMI/DRG weight variables in the current dataset, the evaluation was predominantly epidemiological and organisational.

RESULTS

Total volume and temporal trend (2016–2025)

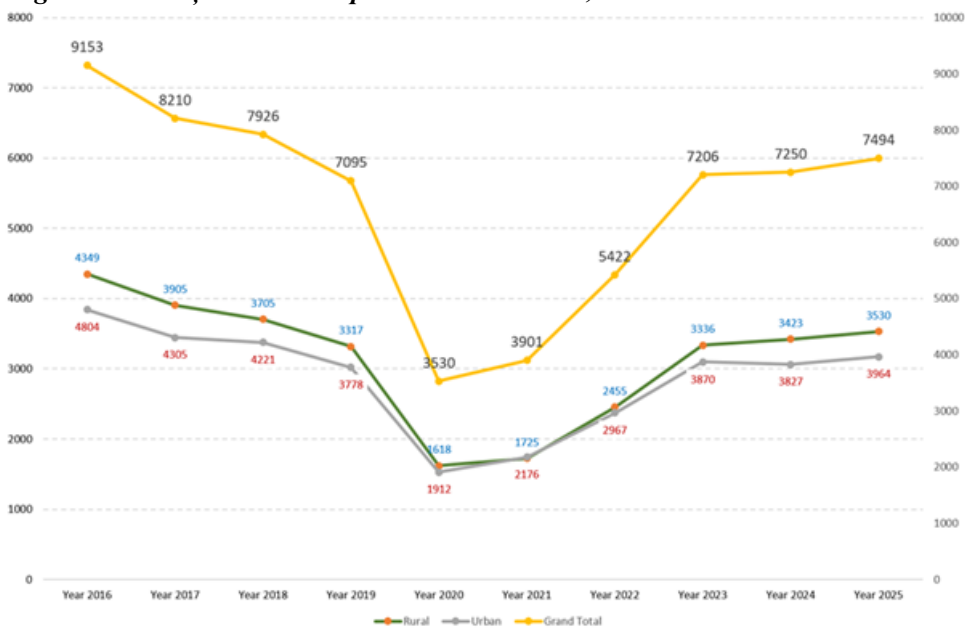
A total of 67,187 hospitalisation episodes with F40–F48 diagnoses were recorded. The annual trend shows:

- high volumes pre-pandemic (e.g., 9,153 episodes in 2016; 7,095 in 2019);
- a sharp decline in 2020 (3,530 episodes) and continued low levels in 2021 (3,901 episodes);
- progressive recovery in 2022–2025, with a post-pandemic peak in 2025 (7,494 episodes).

Figure 1. Annual evolution of F40–F48 hospitalisation episodes, 2016–2025.

Sharp decline in 2020 (~–50% vs 2019) and recovery in 2022–2025. The decline in 2020 compared with 2019 is approximately

Figura 1. Evoluția anuală a episoadelor F40–F48, 2016–2025



–50%, consistent with disrupted access and service reorganisation during the pandemic, followed by gradual recovery.

Place of residence (urban/rural)

The distribution was relatively balanced, with a slight urban predominance:

- Urban: 35,824 episodes (53.3%)
- Rural: 31,363 episodes (46.7%) This modest difference suggests substantial hospital utilisation among rural residents, potentially reflecting barriers to community-based services.

Sex

- Women: 38,696 episodes (57.6%)
- Men: 28,491 episodes (42.4%) Female predominance was consistent across years, aligning with the epidemiological profile of anxiety and stress-related disorders and potentially with higher service-seeking behaviour.

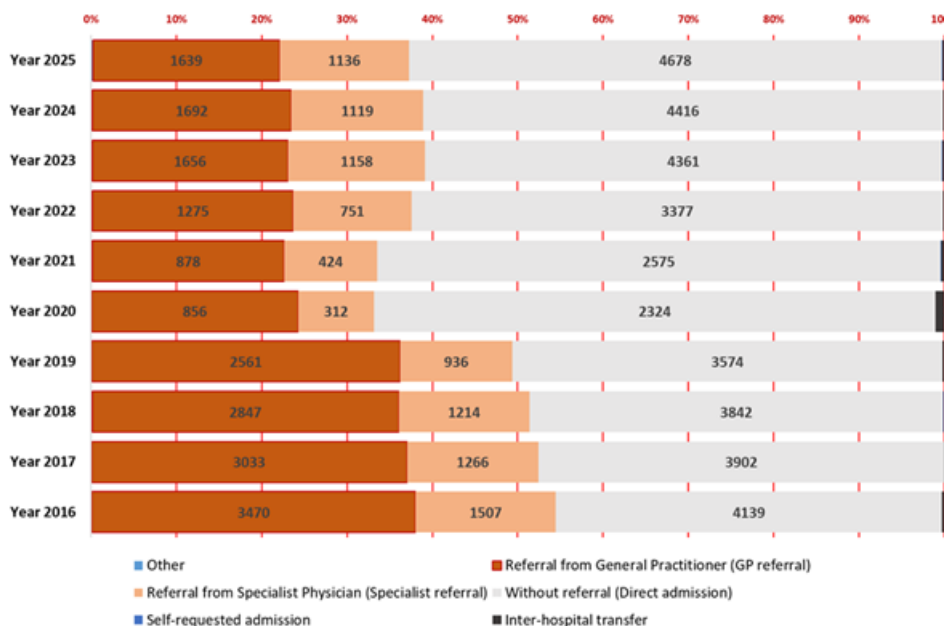
Admission type (access pathway) (Figure 2)

- Without referral letter: 37,188 (55.3%)
- GP referral: 19,907 (29.6%)
- Specialist referral: 9,823 (14.6%)
- Inter-hospital transfer: 156 (0.23%)
- Self-requested admission: 23 (0.03%)
- Other: 90 (0.13%)

Without referral ≈55% of the total; indicates direct/emergency access and a potential deficit of outpatient services.

The high proportion of non-referral admissions suggests reliance on direct access/urgent pathways →

Figure 2. Annual evolution of F40–F48 hospitalisation episodes, admission type, 2016–2025.



The sharp post-2022 increase in Maramureş warrants explicit discussion as a potential outlier.

Diagnostic structure (F40–F48) (Figure 4)

Most frequent diagnoses (total 2016–2025):

- F41.2 Mixed anxiety and depressive disorder: 13,806 (~20.5%)
- F43.2 Adjustment disorder: 7,689 (~11.4%)
- F42.0 Predominantly obsessional thoughts: 5,986
- F42.2 Mixed obsessional thoughts and acts: 5,180
- F41.0 Panic disorder: 4,831
- F41.1 Generalised anxiety disorder: 4,787

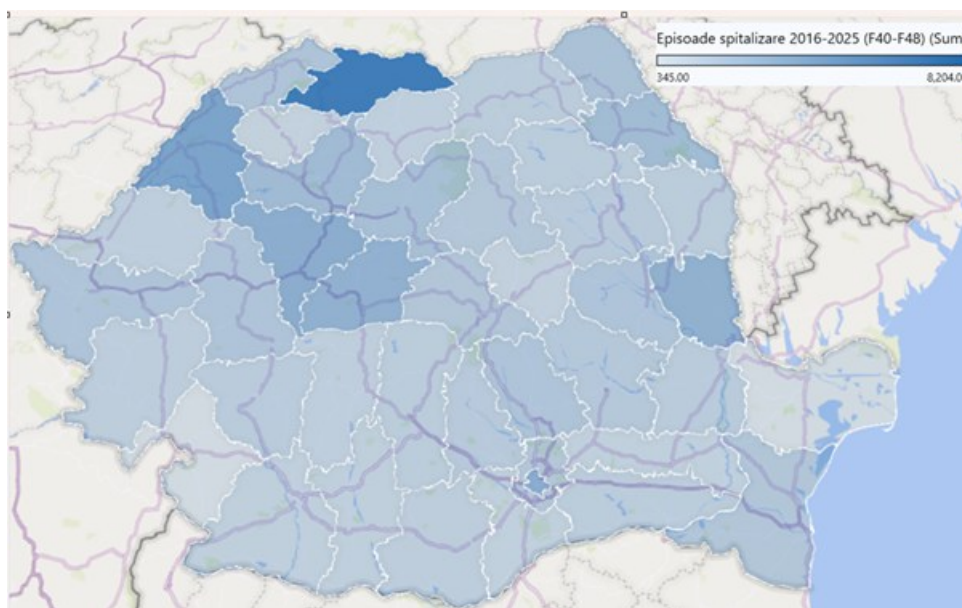
F41.2 predominates (~20%); F43.2 and F42 (obsessive-compulsive disorder) also make major contributions.

The pattern is dominated by mixed anxiety–depression and stress/adjustment disorders. OCD-related codes increased visibly in recent years (2023–2025), which may reflect increased demand and/or improved recognition/coding.

Length of stay (DS)

Length of stay was concentrated in short-to-medium intervals (especially 2–7 days), with a long tail of rare, very long stays (over 100 days). This suggests many admissions for acute stabilisation/diagnostic clarification/therapy adjustment, while very long stays may represent complex cases, comorbidities or social factors.

Figure 3. Cartogramme with No. of hospitalisations F40–F48, 2016–2025



and possibly limited rapid access to outpatient/community mental health care.

Territorial distribution (counties) (Figure 3)

Marked heterogeneity was observed. High total volumes included:

- Maramureş: 8,204 episodes (with a steep increase in 2022–2025: 1,051 → 1,887 → 2,047 → 2,159)
- Bihor: 4,557; Bucharest: 3,849; Alba: 3,695; Galaţi: 3,359; Sibiu: 3,316; Iaşi: 2,341; Cluj: 2,466, etc.

Differences may reflect both true burden and reporting/coding practices, service structure and local changes.

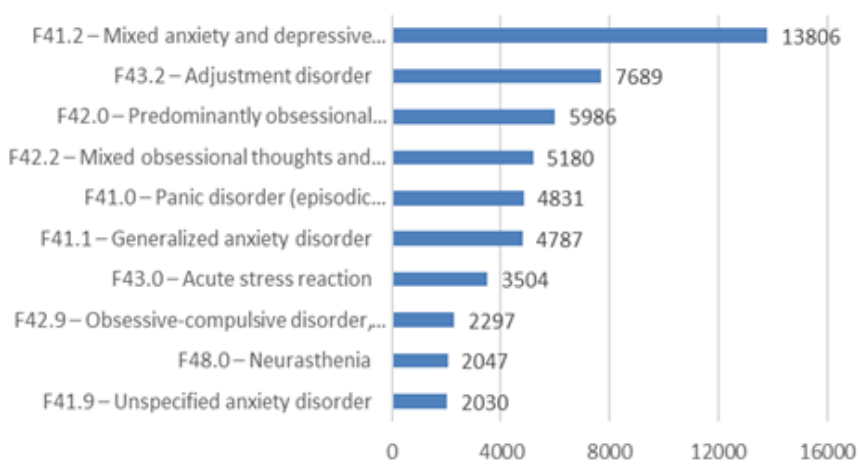
Discharge status

- Improved: 61,648 (91.8%)
- Unchanged: 3,837 (5.7%)
- Cured: 1,370 (2.0%)
- Worsened: 128 (0.19%)

Deceased: 204 (0.30%) Most discharges were coded as “improved”, typical for stabilisation admissions. The presence of a small number of deaths requires cautious interpretation (e.g., somatic comorbidities, older age, or coding variation).



Figure 4. Cumulative No. of hospitalisations after ICD code, 2016–2025



DISCUSSION

This study describes hospital utilisation for F40–F48 disorders in Romania during 2016–2025 and highlights several patterns relevant to clinical practice and health policy. The sharp decline in 2020–2021 and subsequent recovery is consistent with the pandemic’s impact on access and hospital functioning. The near-balanced urban/rural distribution suggests substantial utilisation among rural residents, potentially indicating limited availability of outpatient and community mental health services. The consistent female predominance aligns with known epidemiological patterns and differences in service use.

A key managerial finding is the very high share of admissions without a referral letter, suggesting predominant direct access and potential shortcomings in outpatient referral pathways. From a system perspective, this may increase hospital resource use for episodes that could be managed in outpatient settings through psychotherapy, community psychiatry and crisis interventions.

The diagnostic structure—dominated by mixed anxiety–depressive disorder and adjustment disorder—supports the hypothesis of significant psychosocial stress burden. The marked territorial heterogeneity, including sharp increases in specific counties after 2022, indicates the need to assess service structure, inter-county flows and coding consistency. Sensitivity analyses (e.g., excluding outlier counties or population standardisation) would strengthen interpretation if demographic denominators become available.

CONCLUSIONS

1. Between 2016 and 2025, 67,187 hospitalisation episodes for F40–F48 disorders were recorded in Romania, with a major decline in 2020–2021 and recovery in 2022–2025.
2. Urban/rural distribution was relatively balanced (53% vs 47%), indicating substantial hospital utilisation among rural residents.
3. Female predominance (~58%) was observed, consistent with the epidemiology of anxiety and stress-related disorders.

4. More than half of admissions occurred without referral, suggesting the need to strengthen outpatient and community services and optimise referral pathways.

5. The most common diagnoses were F41.2 and F43.2, followed by OCD-related disorders and panic/anxiety disorders.

6. Most discharges were coded as “improved” (~92%), and length of stay was predominantly short-to-medium, consistent with stabilisation admissions.

Policy and managerial implications. The high proportion of non-referral admissions indicates an important role of hospitals as a first-contact service for anxiety crises and stress-related reactions. Strengthening outpatient and community mental health services

(community psychiatry, accessible psychotherapy, brief crisis interventions, stress-management programmes) and optimising GP referral pathways could reduce hospital pressure and improve continuity of care. Territorial heterogeneity further supports the need for coding audits and regional planning targeting areas with very high volumes or abrupt increases.

References (Vancouver)

1. World Health Organization. *Anxiety disorders: fact sheet* [Internet]. 8 Sep 2025 [cited 2026 Feb 20]. Available from: <https://www.who.int/news-room/fact-sheets/detail/anxiety-disorders>
2. Institutul Brainmap. *Ce este stresul? Tipuri de stres, simptome și soluții* [Internet]. 18 Nov 2024 [cited 2026 Feb 20]. Available from: <https://institutulbrainmap.ro/ce-este-stresul-tipuri-simtome-solutii/>