*Macedonian Pharmaceutical Bulletin*, 72 (Suppl 1) 467 - 468 (2026)
Online ISSN: 1857-8969
DOI: 10.33320/maced.pharm.bull.2026.72.03.225
*Short communication*

# Central nervous system drug utilization in N. Macedonia: a trend analysis

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## Introduction

Diseases of the central nervous system (CNS) represent one of the leading public health challenges worldwide due to their increasing prevalence, chronic progression and significant socioeconomic burden (WHO, 2022). CNS disorders include neurological and psychiatric diseases such as depression, anxiety disorders, epilepsy, schizophrenia, Parkinson's disease, Alzheimer's disease, migraine and other neurodegenerative conditions. These disorders considerably affect patients' quality of life, social functioning and work productivity, while simultaneously increasing healthcare expenditures through long-term treatment, hospitalization, rehabilitation and supportive care.

In recent decades, the prevalence of CNS diseases has increased globally due to population aging, urbanization, chronic stress exposure, lifestyle changes and improved diagnostic procedures. Mental and neurological disorders are now recognized among the leading causes of disability worldwide. Consequently, the utilization of medicines acting on the nervous system has also increased significantly. Drug utilization studies therefore provide important information regarding prescribing trends, healthcare priorities, rational pharmacotherapy and healthcare expenditures.

In N. Macedonia, medicines acting on the nervous system (ATC group N) are among the most frequently prescribed and reimbursed therapeutic groups (HIFRNM, 2025a). Monitoring medicine utilization is performed continuously through analyses of prescription numbers, therapeutic groups, defined daily doses (DDD) and financial expenditures (HIFRNM, 2025b).

## Drug consumption in N. Macedonia

According to the Health Insurance Fund of N. Macedonia, overall prescription drug utilization has shown a continuous increase between 2016 and 2024 (HIFRNM, 2025b). In 2024, approximately 26.15 million prescriptions were realized, representing an increase of about 3.2% compared with 2023, while total expenditures for reimbursed prescription medicines reached approximately 3.27 billion Macedonian denars (HIFRNM, 2025b).

Medicines acting on the nervous system (ATC group N) represented one of the leading therapeutic categories in terms of prescription frequency. In 2024, drugs from ATC group N accounted for 4,166,891 realized prescriptions, representing

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15.93% of the total prescription drug consumption and showing a 2.68% increase compared with 2023. ATC group N ranked third among all therapeutic groups, after cardiovascular drugs and drugs acting on the digestive system and metabolism (HIFRNM, 2025b).

The increasing utilization of CNS medications may be associated with several factors, including increasing prevalence of mental health disorders, aging population, improved diagnostics, chronic and recurrent nature of psychiatric and neurological diseases and prolonged duration of treatment.

Particularly notable is the increased use of antidepressants and anxiolytics, reflecting the growing prevalence of stress-related disorders, anxiety and depression. In 2024, the utilization of medicines from ATC group N reached 92.56 defined daily doses (DDD) per 1000 insured persons per day, representing a 4.52% increase compared with 2023 (HIFRNM, 2025b). This finding indicates a continuous upward trend in the consumption of CNS medications within the national healthcare system and suggests an increasing therapeutic demand for the management of neurological and psychiatric disorders.

Similar increasing trends in psychotropic and CNS medication utilization have also been reported in other countries from the Western Balkan region and Southeast Europe, particularly regarding antidepressants and anxiolytics (Filimonovic et al., 2025).

## Healthcare and economic impact

CNS diseases impose substantial direct and indirect costs on healthcare systems. Direct costs include expenditures associated with medications, hospitalization, diagnostics, specialist consultations, rehabilitation, and long-term treatment. Indirect costs involve reduced productivity, absenteeism, disability, early retirement, and social support expenditures.

According to the Annual Report of the HIFRNM, the total number of insured persons covered by mandatory health insurance in 2024 reached 1,839,537 individuals (HIFRNM, 2025a). The increasing number of elderly insured persons contributes significantly to higher consumption of medicines for chronic neurological and psychiatric diseases.

The growing utilization of reimbursed medicines creates additional financial pressure on the healthcare system, emphasizing the importance of rational prescribing and pharmacoeconomic optimization. Healthcare professionals, particularly physicians and pharmacists, play a key role in ensuring safe and rational use of CNS medications through patient counseling, adherence monitoring, pharmacovigilance, and prevention of medication misuse.

## Conclusion

Diseases of the central nervous system represent a growing public health challenge in N. Macedonia due to their increasing prevalence and chronic nature. The continuous rise in the consumption of CNS medications, particularly antidepressants and anxiolytics, reflects the increasing burden of neurological and psychiatric disorders within the population. Monitoring drug utilization patterns is essential for promoting rational pharmacotherapy, optimizing healthcare expenditures and improving patient outcomes. Future healthcare strategies should focus on early diagnosis, mental health promotion, patient education, and interdisciplinary approaches aimed at improving the prevention and management of CNS diseases.

## References

Filimonović, J. et al., 2025. Utilization of psychotropic drugs in Serbia from 2006 to 2021: patterns before and during the COVID-19 pandemic. PLoS One 20, e0330749. https://doi.org/10.1371/journal.pone.0330749

Health Insurance Fund of the Republic of North Macedonia, 2025a. Annual Report 2024. https://fzo.org.mk/sites/default/files/fzo/izvestai/godisen-izvestaj-2024.pdf

Health Insurance Fund of the Republic of North Macedonia, 2025b. Annual Report on Prescription Drug Consumption in Community Pharmacies for 2024.https://fzo.org.mk/sites/default/files/fzo/izvestai/260209-izveshtaj-potroshuvachka-lekovi-2024-.pdf

World Health Organization, 2022. Mental disorders. https://www.who.int/news-room/fact-sheets/detail/mental-disorders