

ABSTRACT NO:16
RESEARCH ARTICLE**Temporal Trends in the Age-Standardised Incidence of Brain and Central Nervous System Cancers in Pakistan: A Global Burden of Disease Study (1990–2021)**Wania Moeen¹, Muhammad Sohaib Khan², Aswah Moeen³, Hafsa Rais⁴, Muhammad Salif Moeen⁵**Abstract**

Objective: The primary objective of this study was to analyze long-term trends in the age-standardized incidence of brain and CNS cancers in Pakistan utilizing GBD data from 1990 to 2021.

Methods: Age-standardized incidence rates (ASIRs) of brain and CNS cancers per 100,000 population were extracted on 29th July 2026 from the Global Burden of Disease database (Institute for Health Metrics and Evaluation; <https://vizhub.healthdata.org/gbd-results/>) for Pakistan, covering the period 1990–2021. Data were obtained for the overall population and stratified by sex to assess sex-specific patterns. Temporal trends in ASIR were evaluated using Joinpoint Regression software. For each identified segment, the annual percentage change (APC) was calculated, and the average annual percentage change (AAPC) was computed across the full study period to summarize the overall trend. All estimates were reported with 95% confidence intervals (CIs). P value of <0.05 was considered statistically significant.

Results: The ASIR demonstrated a consistent upward trajectory, rising from 1.69 per 100,000 in 1990 to 2.18 per 100,000 in 2021 (AAPC: 0.84; 95% CI: 0.74–0.91). From 1990 to 2018, the ASIR increased gradually from 1.69 to 2.02 (APC: 0.59; 95% CI: 0.52–0.65), followed by a marked acceleration between 2018 and 2021, during which the ASIR climbed from 2.02 to 2.18 (APC: 3.2; 95% CI: 1.7–5.4). Gender-stratified analysis revealed that male ASIRs exceeded female rates during the earlier decades; however, from 2013 onwards, females demonstrated consistently higher ASIRs, reaching 2.30 per 100,000 by 2021 compared to 2.09 per 100,000 in males.

Conclusion: The age-standardized incidence of brain and other CNS cancers in Pakistan increased steadily from 1990 to 2021, with a marked acceleration after 2018 and an emerging female predominance from 2013 onwards. These findings underscore the urgent need for strengthened cancer surveillance infrastructure, enhanced early detection programmes, and expanded neuro-oncology services to effectively address this growing public health burden.

Keywords: Brain Cancer, Incidence Trends, Pakistan

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