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Cancers of the brain and central nervous system: global patterns and trends in incidence

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Abstract

Background: Global comparisons of the burden and impact of cancers of the brain and central nervous system (CNS) are critical for developing effective control strategies and generating etiological hypotheses to drive future research.

Methods: National incidence estimates were obtained from GLOBOCAN 2022, and recorded incidence data from the Cancer in Five Continents series, both developed and compiled by the International Agency for Research on Cancer. We examined the estimated age-standardized incidence rates in 185 countries, as well as time trends in recorded incidence in 35 countries, quantifying the direction and change in the magnitude of the rates using the estimated average percentage change (EAPC).

Results: In 2022, 322,000 new cases of brain and CNS tumors were estimated globally. By world region, the highest incidence rate was seen in Northern America (5.46 per 100,000), Eastern Asia (3.95), and Western Europe (5.56). Africa had relatively lower incidence rates. By country and age group, Austria and the U.S. exhibited the highest rates in boys (3.5 in both), while in adolescents and young adults (AYA), Norway had the highest incidence rates in both males (4.7) and females (3.8). Among adults (+ 40yo), the highest rates in males were observed in the Northern European countries of Norway (18.6), Lithuania (18.4), and Latvia (16.7). In terms of time trends, incidence rates tended to be rather stable in most world regions over the last decade, though increases were observed in selected countries. Trends-based predictions indicate that if incidence rates remain stable, population ageing and growth would mean there would be 474,000 new cases by the year 2045, a 47% increase from 2022.

Conclusion: While the increased incidence rates in certain populations require further study, the future predictions based on stable rates to 2045 are of particular concern, with a close to 50% increase in the number of brain and CNS cancer patients expected over the coming decades. A global 2% decline in rates would be needed to ensure the future brain and CNS cancer burden does not exceed present levels.

Keywords: Age-period-cohort models; Brain cancer; Gliomas; Incidence rates; Trends.