

Geographical and temporal incidence patterns of childhood central nervous system tumours in Europe: Insights from the European Cancer Information System

Eva González-Cantó, Laia Barrachina-Bonet, Guillermo Bargues-Navarro, Clara Caverro-Carbonell, Carmen Martos

Rare Disease Research Unit. The Foundation for the Promotion of Health and Biomedical Research (Fisabio), Valencia, Spain.

INTRODUCTION

Central nervous system (CNS) tumours are the most common solid **childhood** malignancies and comprise heterogeneous histological subtypes.

The **European Cancer Information System (ECIS)** compiles standardized information from **Population-Based Cancer Registries (PBCRs)** across Europe, ranging from national to regional areas, allowing comparable analyses across countries and regions.

Identifying **spatial and temporal variations** is essential for cancer control and **hypothesis generation** on potential risk factors.

OBJECTIVE

To describe **geographical and time trends** in the incidence of **childhood CNS tumours** across Europe using **ECIS**.

METHODS



ECIS - European Cancer Information System
Home | Explore the data | Factsheets | About ECIS



Age-Standardized Incidence Rates (ASIRs)

Including:

- Children ≤ 14 years
- PBCRs updated to ≥ 2019
- Tumour classification based on ICC-3

Geographic analysis

- Study period: **2017-2021**.
- PBCR with at least **3 calendar years of data**.
- Indicator: **ASIRs** obtained from ECIS and 95% confidence intervals (**95% CI**) computed.

Time trends

- Study period: **1982-2023** (3-years period).
- PBCR with at least **10 consecutive three-year periods**.
- Indicator: **ASIRs**.
- Method: **Joinpoint regression**.

Average Annual Percent Changes (AAPC)

RESULTS

Geographic analysis

29 PBCRs from 17 European countries

Overall CNS tumours

Highest ASIR:
Emilia-Romagna
64.3 (95%CI: 54.0–74.6)

Lowest ASIR:
Cyprus
15.1 (95%CI: 6.1–24.1)

Time trends

16 PBCRs from 11 European countries

↑ Significant increases in 12 PBCRs → AAPC: 2.4% – 9.5%



Registry	Austria	Basque Country (Spain)	Denmark	Emilia Romagna (Italy)	Estonia	Finland	Germany	Murcia (Spain)	Netherlands	Norway	Piedmont (Italy)	Slovenia	Switzerland	Tarragona (Spain)	Valencian Region (Spain)	Veneto (Italy)
AAPC	4.0*	0.5	4.1*	6.0*	6.9*	2.4*	8.3*	4.3	6.2*	3.4*	4.8*	5.1*	5.0*	9.5*	1.1	-0.5
Lower CI	2.1	-7.2	1.9	2.9	2.7	1.0	6.1	-5.7	2.7	0.7	2.4	2.3	1.4	1.0	-1.3	-7.2
Upper CI	6.0	9.1	7.4	9.1	11.1	3.9	9.8	15.4	9.7	6.1	7.2	8.0	8.7	15.6	3.4	6.7

CONCLUSIONS

- Childhood CNS tumour incidence showed marked geographical variation across European PBCRs.
- Increasing incidence trends were observed in most registries over time.
- ECIS represents a valuable resource for monitoring childhood CNS tumours in Europe.
- However, some limitations remain, including the lack of sex-specific data and incomplete updates in certain registries.