**Supplementary materials**

Suppl Table 1

Published literature reporting the incidence of epilepsy in children (1 month–4 years) in Europe, Canada, and the United States.

| Author (year) | Country, study period | Study design, data source | Study population | Epilepsy definition | Number of cases | Incidence of epilepsy | Estimated range  of incidence proportion of focal onset seizures |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Babunovska et al. [11] (2021) | North Macedonia, 2015–2018 | Retrospective nationwide population-based study, national health care platform | Average annual number of enrollees of national health care (*N* = 2,073,317; ~95% of total population)  0–2 years: NR  Febrile seizures were excluded | *ICD-10* code: G40.0-9 and additional coded data for ASM | 0–2 years: NR | Annual incidence per 100,000 children:  2015: 0–2 years: 56.42 per 100,000 children  2016: 0–2 years: 104.4 per 100,000 children  2017: 0–2 years: 98.3 per 100,000 children  2018: 0–2 years: 72.28 per 100,000 children | Annual incidence per 100,000 children:  2015: 0–2 years: 21.78 to 38.93 per 100,000 children  2016: 0–2 years: 40.30 to 72.04 per 100,000 children  2017: 0–2 years: 37.94 to 67.83 per 100,000 children  2018: 0–2 years: 27.90 to 49.87 per 100,000 |
| Symonds et al. [6] (2021) | United Kingdom, 2014–2017 | Prospective cohort study, tertiary children hospital data | Whole population of Scotland in year 2017  (*N* = 5,424,800)  Febrile and acute symptomatic seizures were excluded | ILAE 2017 | 0–3 years: 390 | Crude incidence per 100,000 live births: 230 per 100,000 live births (95% CI 208–254)  Adjusted incidence per 100,000 live births: 239 per 100,000 live births (95% CI 216–263) | Crude incidence per 100,000 live births: 158.7 (95% CI 143.5–165.1)  Adjusted incidence per 100,000 live births: 164.9 (95% CI 140.4–181.5) |
| Hunter et al. [3] (2020) | United Kingdom, 2013–2015 | Prospective population-based study, hospital data | Children population (0–5 years) at risk (*N* = 45,244)  <1 year: 9527  1–<2 years: 9348  2–<3 years: 9174  3–<4 years: 8917  4–<5 years: 8278  Febrile seizures were excluded | ILAE 2017 | <1 year: 19  1–<2 years: 8  2–<3 years: 4  3–<4 years: 14  4–<5 years: 14 | Ascertainment adjusted annual incidence per 100,000 children:  <1 year: 92.3 (95% CI 50.9–133.8)  1–<2 years: 44.4 (95% CI 15.4–73.5)  2–<3 years: 20.1 (95% CI 0.4–39.9)  3–<4 years: 73.5 (95% CI 35.3–111.8)  4–<5 years: 87.8 (95% CI 44.4–131.2)  0–<5 years: 61.7 (95% CI 46.2–77.3) | Ascertainment adjusted annual incidence per 100,000 children:  <1 year: 35.6 (95% CI 19.6–51.6) to 60.0 (95% CI 33.09–87.0)  1–<2 years: 17.1 (95% CI 5.9–28.4) to 30.6 (95% CI 10.6–50.7)  2–<3 years: 8.9 (95% CI 0.2–17.6) to 13.9 (95% CI 0.3–27.5)  3–<4 years: 32.4 (95% CI 15.6–49.3) to 50.7 (95% CI 24.4–77.1)  4–<5 years: 38.7 (95% CI 19.6–57.9) to 60.6 (95% CI 30.6–90.5)  0–<5 years: 27.2 (95% CI 20.4–34.1) to 42.6 (95% CI 31.9–53.3) |
| Aaberg et al. [25] (2017) | Norway, 1999–2012 | Nationwide cohort study, registry and questionnaire data | Children 3–13 years of age born in participating 52 Norwegian maternity wards (*N* = 112,744)  Febrile seizures were excluded | ILAE 2014 | 0 year: ~145  1 year: ~70  2 years: ~50  3 years: ~60  4 years: ~60 | Cumulative incidence per 100,000 children:  Age 1 year: 210 (95% CI 190–240)  Age 5 years: 450 (95% CI 410–490)  Age 0–4 years\*: 314.6 (95% CI 284.7–347.6)  Incidence rate per 100,000 person-years:  Age <1 year: 144 (95% CI 122–168)  Age 1–4 years: 61 (95% CI 54–68)  Age 0–4 years\*: 77.9 (95% CI 70.5–86.1)  Follow-up: NR | Cumulative incidence per 100,000 children:  Age 1 year: 81.1 (95% CI 73.3–105.8) to 136.5 (95% CI 123.5–156)  Age 5 years: 198.5 (95% CI 180.8–216.1) to 310.5 (95% CI 282.9–338.1)  Age 0–4 years: 138.7 (95% CI 125.6–153.3) to 217.1 (95% CI 196.4–239.8)  Incidence rate per 100,000 person-years:  Age <1 year: 55.6 (95% CI 47.1–64.8) to 93.6 (95% CI 79.3–109.2)  Age 1–4 years: 26.9 (95% CI 23.8–30.0) to 42.1 (95% CI 37.3–46.9)  Age 0–4 years: 34.4 (95% CI 31.1–38.0) to 53.8 (95% CI 48.6–59.4) |
| Gaily et al. [20] (2016) | Finland, 1997–2006 | Population-based retrospective study, university hospital data | Infant (age <1 year) population of study area from 1997 to 2006  (*N* = 127,730)  Infants with febrile or neonatal seizures were excluded | *ICD-10* G40.0–40.9 | Age <1 year: 158 | Cumulative incidence per 100,000 children:  Age <1 year:  124 | Cumulative incidence per 100,000 children:  Age <1 year:  47.9–80.6 |
| Kim et al. [26] (2016) | United States, 2012 | Retrospective population-based study, nationwide claims database | Average annual number of enrollees of 0–19 years of age from 2008 to 2011 in commercial claims and Medicaid database  (*N* = 8.8 million)  0 year: 1,106,567  1 year: 352,937  2 years: 347,590  3 years: 364,956  4 years: 377,833  Neonatal seizures were excluded | Occurrence of ≥2 *ICD-9-CM* codes 345.xx  Occurrence of 1 *ICD-9-CM* code 345.xx and ASM prescription(s)  Occurrence of ≥2 *ICD-9-CM* codes 780.3x and ASM prescription(s) | 0 year: 2409  1 year: 511  2 years: 332  3 years: 298  4 years: 307 | Annual incidence per 100,000 children:  0 year: 217  1 year: 162  2 years: 122  3 years: 92  4 years: 96  0–4 years\*: 151.3 (95% CI 146.6–156.1) | Incidence per 100,000 children:  0 year: 83.8 to 141.1  1 year: 62.5 to 111.8  2 years: 47.1 to 84.2  3 years: 40.6 to 63.5  4 years: 42.3 to 66.2  0–4 years: 66.7 (95% CI 64.7–68.8) to 104.4 (95% CI 101.1–107.7) |
| Saarinen et al. [27] (2016) | Finland, 2008–2012 | Nationwide population-based study, national registry data including population register, special reimbursement register, drug purchase register | Finnish children <16 years of age during 1968–2012  (*N* = 952,010)  Neonatal seizures were excluded | *ICD-10* code of epilepsy and ASM prescription | Age <1 year: 349  Age 1–5 years: 934 | Incidence rate per 100,000 person-years:  Age <1 year: 116.7  Age 1–5 years: 62.9  Age 0–5 years: 71.9  Follow-up: NR | Incidence rate per 100,000 person-years:  Age <1 year: 45.0 to 75.9  Age 1–5 years: 27.7 to 43.4 |
| Helmers et al. [34] (2015) | United States, 2011 | Retrospective observational study, Commercial claims and Medicare insurance data | Average number of enrolled population in commercial claims and Medicare insurance during 2007–2011 in age group 0–4 years  (*N* = 1,256,138) | Occurrence of ≥2 *ICD-9-CM* codes 345.xx  Occurrence of 1 *ICD-9-CM* code 345.xx and ASM prescription(s)  Occurrence of ≥2 *ICD-9-CM* codes 780.3x and ASM prescription(s) | Average number of incident cases between 2009 and 2011:  0–4 years: 1269 | Annual incidence proportion per 100,000 children:  0–4 years: 162 | Incidence proportion per 100,000 children:  0–4 years: 71.4 to 111.8 |
| Cesnik et al. [35] (2013) | Italy, 2007–2008 | Prospective population-based study, registry data | Children 0–4 years of age population at risk  (*N* = 10,991) | ILAE 1981, 1989, 1993, 2008 | 0–4 years: 7 | Annual incidence per 100,000 person-years:  0–4 years: 63.6 (95% CI 25.5–131) | Annual incidence per 100,000 person-years:  0–4 years: 28.0 (95% CI 11.2–57.8) to 43.9 (95% CI 17.6–90.4) |
| Eltze et al. [21] (2012) | United Kingdom, 2005–2006 | Population-based prospective survey study, questionnaire data | Mid-population estimates for children <2 years of age for year 2006 provided by the Office for National Statistics for the surveyed area (*N* = 98,090).  Neonatal and provoked seizures were excluded | ILAE 2001 | <2 years: 57 | Annual incidence per 100,000 children:  <1 year: 82.1 (95% CI 61.4–109.8)  1–2 years: 23.4 (95% CI 13.3–40.8) | Annual incidence per 100,000 children:  <1 year: 31.7 (95% CI 23.7–42.4) to 53.4 (95% CI 39.9–71.4)  1–2 years: 9.0 (95% CI 5.1– 15.7) to 16.1 (95% CI 9.2–28.2) |
| Meeraus et al. [28] (2013) | United Kingdom, 2001–2008 | Observational study, THIN (The Health Improvement Network) database, primary care data | Children years at risk  0 year: 222,534  1 year: 186,687  2 years: 157,338  3 years: 133,531  4 years: 112,641 | Code lists for ASM prescription, epilepsy diagnoses or epilepsy symptoms | 0 year: 490  1 year: 230  2 years: 159  3 years: 101  4 years: 77 | Annual incidence per 100,000 person-years:  0 year: 220.2 (95% CI 201.1–240.6)  1 year: 123.2 (95% CI 107.8–140.2)  2 years: 101.1 (95% CI 86.0–118.0)  3 years: 75.6 (95% CI 61.6–91.9)  4 years: 68.4 (95% CI 53.9–85.4)  0–4 years\*: 130.1 (95% CI 122.5–138.1) | Annual incidence per 100,000 person-years:  0 year: 85.0 (95% CI 77.6–92.9) to 143.1 (95% CI 138.8–166.0)  1 year: 47.6 (95% CI 41.6–54.1) to 85.0 (95% CI 74.4–96.7)  2 years: 39.0 (95% CI 33.2–45.5) to 69.8 (95% CI 59.3–81.4)  3 years: 33.3 (95% CI 27.2–40.5) to 52.2 (95% CI 42.5–63.4)  4 years: 30.2 (95% CI 23.8–37.7) to 47.2 (95% CI 37.2–58.9)  0–4 years: 57.4 (95% CI 54.0–60.9) to 89.8 (95% CI 84.5–95.3) |
| Casetta et al. [29] (2011) | Italy, 1996–2005 | Population-based prospective study, multisource registry | Mean population in the considered age groups during 1996 to 2005  Person-years at risk:  <1 year: 21,020 person- years  1–4 years: 86,595 person-years  Acute symptomatic seizures, neonatal seizures or febrile seizures were excluded | ILAE 1993, and 1997, *ICD-9* and *ICD-9-CM* code 345 | <1 year: 23  1–4 years: 51 | Annual incidence rate per 100,000 person-years:  <1 year: 109.4 (95% CI 69.4–164.1)  1–4 years: 58.9 (95% CI 43.9–78.5)  0–4 years\*: 68.8 (95% CI 54.8–86.3) | Annual incidence rate per 100,000 person-years:  <1 year: 42.2 (95% CI 26.8–63.3) to 71.1 (95% CI 45.1–106.7)  1–4 years: 26.0 (95% CI 19.4–34.6) to 40.6 (95% CI 30.3–54.2)  0–4 years\*: 30.3 (95% CI 24.2–38.1) to 47.5 (95% CI 37.8–59.5) |
| Wirrell et al. [30] (2011) | United States, 1980–2004 | Population-based retrospective study, hospital data | Children population of Olmsted county (*N* = NR)  Acute symptomatic and febrile seizures were excluded. Neonatal seizures were included only if their seizures recurred after 1 month | ILAE 2005-2009 | 0–1 year: 50  1–4 years: 122 | Annual incidence proportion per 100,000 children:  0–1 year: 102.4  1–4 years: 65.3  0–4 years\*: 73.0 (95% CI 62.9–84.7) | Annual incidence proportion per 100,000 children:  0–1 year†: 39.5 to 66.6  1–4 years†: 28.8 to 45.1  0–4 years: 32.2 (95% CI 27.7–37.4) to 50.4 (95% CI 43.4–58.4) |
| Adelow et al. [31] (2009) | Sweden, 2001–2004 | Prospective registry study, Stockholm Incidence Registry of Epilepsy (SIRE) | Inhabitants of Northern Stockholm (*N* = 998,500)  Patients with acute symptomatic seizures and neonatal seizures were not included | ILAE 1993 | <1 year: 42  1–4 years: 119 | Incidence rate per 100,000 person-years:  Age <1 year: 77.1 (95% CI 53.8–100.4)  Age 1–4 years: 51.7 (95% CI 42.4–61.0)  Age 0–4 years\*: 56.6 (95% CI 48.5–66.0)  Follow-up: NR | Incidence rate per 100,000 person-years:  Age <1 year: 29.8 (95% CI 20.8–38.8) to 50.1 (95% CI 35.0–65.3)  Age 1–4 years: 22.8 (95% CI 18.7–26.9) to 35.7 (95% CI 29.3–42.1)  Age 0–4 years: 25.0 (95% CI 21.4–29.1) to 39.1 (95% CI 33.5–45.5) |
| Martinez et al. [37] (2009) | United Kingdom, 2005 | Cohort study, GPRD (General Practice Research Database), primary care data | Patient years at risk for 0–4 years (*N* = 96,537.54)  Patients with myoclonic and absence seizures which classically occur multiple times daily were excluded | READ code for epilepsy | 0–4 years: 55 | Annual incidence per 100,000 person-years:  0–4 years: 57.0 (95% CI 42.9–74.2)  Mean follow-up: 4.2 years | Annual incidence per 100,000 person-years:  0–4 years: 25.1 (95% CI 18.9–32.7) to 39.3 (95% CI 29.6–51.2) |
| Dura-Trave et al. [22] (2008) | Spain, 2002–2005 | Prospective study, hospital data | Population (2001 census, National Institute of Statistics) of children <15 years age (2001 census, National Institute of Statistics) (*N* = 76,236)  Population at risk was obtained multiplying the population in each age group by the incidence study period (4 years).  Patients with neonatal seizures only, febrile seizures, and other acute symptomatic seizures were excluded | ILAE 1989 and 1997 | <1 year: 22  1 year–<6 years: 66 | Annual incidence per 100,000 children:  <1 year: 95.3 (95% CI 82.8–107.8)  1 year–<6 years: 63.6 (95% CI 61.4–65.8) | Annual incidence per 100,000 children:  <1 year: 36.8 (95% CI 32.0–41.6) to 61.9 (95% CI 53.8–70.1)  1 year–<6 years: 28.0 (95% CI 27.0–29.0) to 43.9 (95% CI 42.4–45.4) |
| Christensen et al. [4] (2007) | Denmark, 1977–2002 | Population-based study, registry data | Persons born in Denmark between 1977 and 2002  (*N* = 1,605,624) | *ICD-8* and *ICD-10* | NR | Cumulative incidence per 100,000 children:  Females:  Age 1 year: 180 (95% CI 170–190)  Age 5 years: 490 (95% CI 480–510)  Males:  Age 1 year: 200 (95% CI 190–210)  Age 5 years: 560 (95% CI 550–580) | Cumulative incidence per 100,000 children:  Females:  Age 1 year: 69.5 (95% CI 65.6–73.3) to 117.0 (95% CI 110.5–123.5)  Age 5 years: 216.1 (95% CI 211.7–224.9) to 338.1 (95% CI 312.0–331.5)  Males:  Age 1 year: 77.2 (95% CI 73.3–81.1) to 130.0 (95% CI 123.5–136.5)  Age 5 years: 247.0 (95% CI 242.6–255.8) to 386.4 (95% CI 379.5–400.2) |
| Olafsson et al. [32] (2005) | Iceland, 1995–1999 | Population-based prospective study, national surveillance data | Population of Iceland  <1 year: 13,828  1–4 years: 57,367  Patients were excluded if they had only provoked (acute symptomatic) seizures, including febrile seizures and neonatal seizures | ILAE 1993 | <1 year: 18  1–4 years: 31 | Incidence rate per 100,000 person-years:  Age <1 year: 130.2  Age 1–4 years: 54.0  Age 0–4 years\*: 68.8 (95% CI 52.1–91.0)  Follow-up: NR | Incidence rate per 100,000 person-years:  Age <1 year: 50.3 to 84.6  Age 1–4 years: 23.8 to 35.1  Age 0–4 years\*: 30.3 (95% CI 23.0–40.1) to 47.4 (95% CI 35.9–62.8) |
| Freitag et al. [33] (2001) | Germany, 1999–2000 | Population-based prospective study, hospital data | Population at risk of Heidelberg and Mannheim cities:  <1 year: 3428  1–<5 years: 16,104  Children with seizures occurring only in the first month of life and children with single or recurrent febrile convulsions were excluded. Children with a first unprovoked seizure or with recurrent or complicated febrile convulsions who received subsequent ASM treatment were excluded | ILAE 1989 | <1 year: 5  1–<5 years: 10 | Annual incidence per 100,000 children:  1 month to <12 months: 145.8 (95% CI 47.4–340.1)  1 year–<5 years: 62.1 (95% CI 29.8–114.2)  0–4 years\*: 76.8 (95% CI 46.5–126.7) | Annual incidence per 100,000 children:  1 month to <12 months: 56.3 (95% CI 18.3–131.3) to 94.8 (95% CI 30.8–221.1)  1 year–<5 years: 27.4 (95% CI 13.1–50.4) to 42.8 (95% CI 20.6–78.8)  0–4 years: 33.9 (95% CI 20.5–55.9) to 53.0 (95% CI 32.1–87.4) |
| MacDonald et al. [36] (2000) | United Kingdom, 1995–1996 | Prospective community-based study, general practitioner and linked hospital data | Population covered by 13 general practices in the National Hospital for Neurology and Neurosurgery-GP linkage scheme (*N* = 100,230)  Age 0–4 years: NR | ILAE 1993 | NR | Annual incidence per 100,000 children:  0–4 years: 86 | Annual incidence per 100,000 children:  0–4 years: 37.9 to 59.3 |
| Abbreviations: CI, confidence interval; *CM, clinical modification*; EEG, electroencephalogram; *ICD-9*, *International Classification of Diseases, Ninth Revision*; *ICD-10*, *International Classification of Diseases, Tenth Revision*; ILAE, International League Against Epilepsy; NR, not reported.  \*Proportions and 95% confidence intervals were calculated using SAS programming: Score method, without continuity correction, also known as Wilson.  †No calculations were made; incidence of focal onset seizures was reported in the publication. | | | | | | | |