## Supplementary material 1: definitions

**Identification of comorbidities**

Comorbidities were defined considering both LTD status and ICD-10 codes recorded at the time of hospitalization, focusing on neurodevelopmental disorders, structural abnormalities on neuroimaging, psychiatric comorbidities, genetic disorders and neurodegenerative disorders.

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| **ICD-10 Codes** | **comorbidities** |
| F06  F07  F09  F20-F29  F30-F39 | Other mental disorders due to brain damage/dysfunction and to physical disease  Personality/behavioural disorders due to brain disease, damage and dysfunction  Unspecified organic or symptomatic mental disorder  Schizophrenia, schizotypal and delusional disorders  Mood [affective] disorders |
| F70-F79  F80-F89  F90-F98 | Mental retardation  Disorders of psychological development  Behavioural and emotional disorders with onset usually occurring in childhood and adolescence |
| C71  D33  Q04  G04-05  G80  I63 | Malignant neoplasm of brainBenign neoplasm of brain and other parts of central nervous system Other congenital malformations of brain  Encephalitis, myelitis and encephalomyelitis  Cerebral palsy  Cerebral infarction |
| Q90-99 | Chromosomal abnormalities, not elsewhere classified |
| G32  **E75** | Other degenerative disorders of nervous system in diseases classified elsewhereDisorders of sphingolipid metabolism and other lipid storage disorders |

**ASM considered**

The ASM that were considered are listed below, including indications of use according to age. Exposure to benzodiazepines included CLB, CNZ, nitrazepam, diazepam (except the rectal form), but not rescue drugs (i.e. rectal diazepam and buccal midazolam).

Table S1: antiseizure medication considered with their international abbreviation and codes in the SNDS

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| **Name of the ASM** | **Abbreviation** | **SNDS code** | **Approval age** |
| Carbamazepine | CBZ | N03AF01 | Children any age |
| Clobazam | CLB | N05BA09 | > 6 years |
| Clonazepam | CNZ | N03AE01 | Children any age |
| Diazepam | DZP | N05BA01 | Children any age |
| Eslicarbazepine | ESL | N03AF04 | > 6 years |
| Ethosuximide | ETH | N03AD01 N03AD51 | Children any age |
| Felbamate | FLB | N03AX10 | > 4 years |
| Gabapentin | GBP | N03AX12 | > 6 years |
| Lacosamide | LCS | N03AX18 | > 4 years |
| Lamotrigine | LTG | N03AX09 | > 2 years |
| Levetiracetam | LVT | N03AX14 | > 1 month |
| Nitrazépam | NZP | N05CD02 | > 18 years |
| Oxcarbazepine | OXC | N03AF02 | > 6 years |
| Perampanel | PER | N03AX22 | > 12 years |
| Phenobarbital | PB | N03AA02 | Children any age |
| Phenytoin | PHE | N03AB02 | Children any age |
| Rufinamide | RUF | N03AF03 | > 4 years |
| Stiripentol | STP | N03AX17 | > 3 years |
| Sulthiame | SUL | N03AX03 | > 6 years |
| Topiramate | TPM | N03AX11 | > 2 years |
| Valproate | VPA | N03AG01 | Children any age |
| Vigabatrin | VGB | N03AG04 | Children any age |
| Zonisamide | ZNS | N03AX15 | > 6 years |

**Bitherapies and polytherapies**

When patients switched from mono- to biotherapy (i.e. two concomitant ASM), or bi- to polytherapy (i.e. at least three concomitant ASM), only bi- and polytherapies maintained for at least 3 months were considered, to avoid considering as association of drugs patterns of drug deliveries related to successive treatments.

**Users and new users**

A user of a particular treatment (benzodiazepine, bitherapy, polytherapy—at least three concomitant ASM—was defined as a CwE with at least two reimbursements of this particular treatment over a 3-month period. A new (or incident) user of a particular treatment (drug, drug class (i.e. benzodiazepines) or drug association—bitherapy, stable bitherapy, polytherapy, etc.) was defined as a patient initiating this specific treatment, i.e. not exposed to the same treatment during the 12 previous months. ASM treatment discontinuation was defined as a period of more than 3 months without any ASM following the last administration of ASM.