# Mapping the Burden of Seizure Emergencies in Spain: a Systematic Literature Review


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Poster HSD71

## Overview

### Question

What is the clinical and economic burden of epileptic seizure emergencies in Spain?

### Investigation

A systematic literature review following PRISMA guidelines was conducted, searching Embase, PubMed, and CINAHL (2010–2025) and grey literature. Data on patient characteristics, clinical outcomes were extracted. Study quality and bias were assessed using ROBINS-I v2.

## RESULTS

### Number of Studies

From 2,758 database hits and 12 hand-searched studies, 47 publications (44 unique observational studies) on epileptic seizure emergencies in Spain were included.

- 3,558 publications from databases
- 2,758 screened
- 35 publications included + 12 publications from hand searches
- 47 publications for analysis corresponding to 44 individual studies

### Epilepsy Population Groups

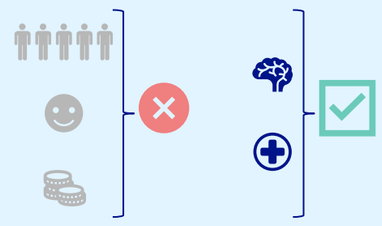
Populations were consolidated to reduce heterogeneity and enable consistent reporting of outcomes. Sixteen population groups were identified, with people with status epilepticus (SE) and those in the emergency department (ED) for seizures being the most represented.


People with SE


People with epileptic seizures at the ED

### Reported Outcomes

Available evidence did not include data on epidemiology, quality of life, or economic burden; only clinical outcomes and healthcare resource use were reported and analysed.



### Burden of Disease

Reporting of seizure emergencies in Spain is heterogeneous and biased towards severe cases, which likely overestimates the burden per patient, but underestimates the overall population burden, since outpatient-managed cases and key groups such as children and older adults are underrepresented.

Nevertheless, seizure emergencies carry high clinical severity, substantial healthcare resource use, and considerable risk of complications and mortality.

### Conclusions

Seizure emergencies in Spain are marked by high severity, complications, mortality, and healthcare use. Evidence remains fragmented with little on economics or quality of life and inconsistent reporting of early treatment. Improved protocols, awareness, education, timely acute therapies, and novel strategies for early seizure intervention are essential to reduce burden and improve outcomes.

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## Background

- Epilepsy affects about 500,000 people in Spain, with highest incidence in children and elderly[1-3].
- Despite treatment advances, 30–40% of people with epilepsy experience uncontrolled seizures and risk of seizure emergencies[4].
- Seizure emergencies increase mortality, impair quality of life, and carry significant economic and social burden[3,5-8].
- Early intervention with benzodiazepines and anti-seizure medications improves outcomes and reduces long-term healthcare impact[1,2].
- Evidence-based strategies are needed to optimise early intervention and out-of-hospital seizure management, reducing clinical risks and costs.

## Objective

- Conduct a Systematic Literature Review (SLR) to synthesise the available evidence on the clinical and economic burden of seizure emergencies in Spain.

## Methods

### DESIGN AND PROTOCOL

- Systematic review was conducted following CRD, Cochrane, and PRISMA 2020 guidelines.
- Research questions were structured using the PICOS framework.
- Protocol was peer-reviewed by epilepsy experts and registered in PROSPERO (CRD420251028523).

### SEARCH STRATEGY

- Searches of Embase, PubMed, and CINAHL for publications from January 2010 to April 2025 were conducted using controlled vocabulary and free-text terms.
- Electronic searches were supplemented with grey literature.

### ELIGIBILITY CRITERIA

- Population: people with epilepsy and seizure emergencies.
- Included: first seizures, newly diagnosed epilepsy, and patients with a history of seizure emergencies.
- Excluded: epilepsy without seizure emergencies.

### DATA EXTRACTION

- Data was extracted using a standardised Excel form and verified for accuracy and risk of bias was assessed with ROBINS-I tool.

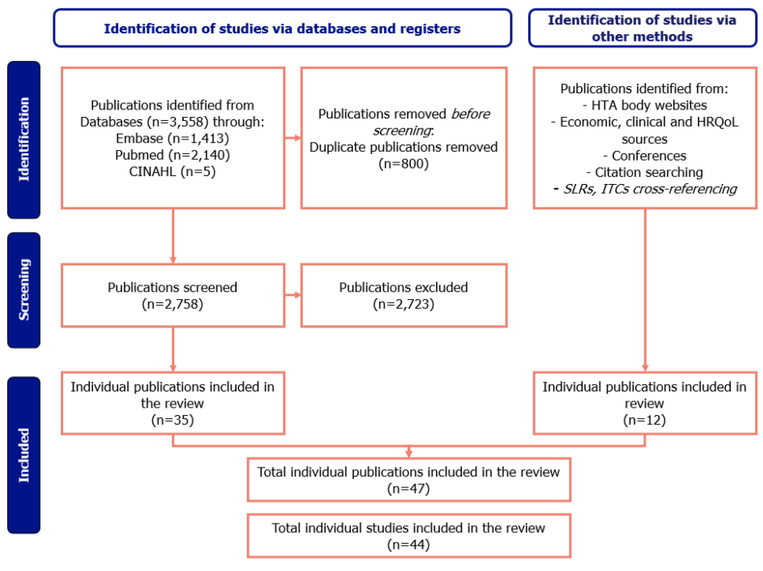
### DATA SYNTHESIS

- Populations were grouped into paediatric (≤15 y.o.) vs. adult (>15 y.o.), validated by an expert panel and based on clinical practice.
- Due to heterogeneity in the populations reported across studies, similar patient groups were consolidated to enable more consistent and unbiased reporting of outcomes.
- Due to heterogeneity, results were narratively synthesised; no meta-analysis was conducted.

## Results

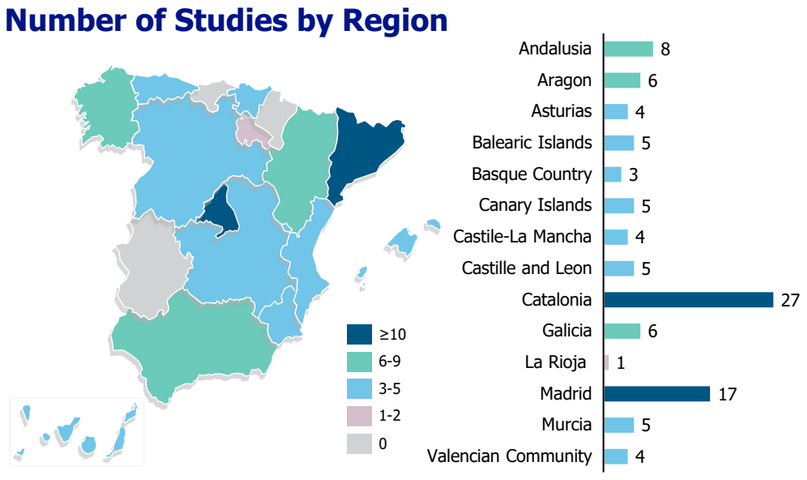
- A total of 47 publications were included, corresponding to 44 unique observational studies on epileptic seizure emergencies in Spain. Main reason for publications exclusion during the screening phase was geographic scope, as many studies were conducted outside of Spain.
- All studies were observational: 68% retrospective, 30% prospective, and 2% of mixed approach.
- Most were single-centre (64%) and nearly half (24 of 44) had <100 participants; 39% had 51-100. Only two studies had >1,000 patients.

### Prisma Flow Diagram




Abbreviations: CINAHL: Cumulative Index of Nursing and Allied Literature Complete; HRQoL: Health-Related Quality of Life; HTA: Health Technology Assessment; ITC: Indirect Treatment Comparison; PRISMA: Preferred Reporting Items for Systematic Reviews and Meta-Analyses; SLR: Systematic Literature Review.

### Number of Studies by Region



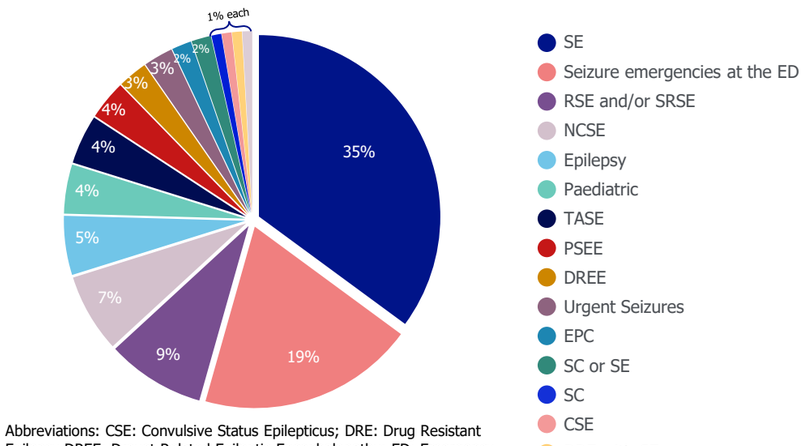

Notes: The number of region representations does not add up to 44 reports included in the review because some studies covered more than one region. Additionally, there are some regions that are not represented (i.e. Cantabria, Navarra, and Extremadura)

- Geographically, Catalonia and Madrid were the most represented regions in the country (27 and 17 studies, respectively), followed by Andalusia (8), Aragón, and Galicia (6 each).

### POPULATION GROUPS

- A total of 16 distinct epilepsy population groups were identified, and the most frequently identified group was people with status epilepticus (SE) with 35% of records followed by people presenting with epileptic seizures at the emergency department with 19% of all record hits.
- The results of the SLR highlight a bias in the published literature towards more severe cases.

### Population Groups Representation




Abbreviations: CSE: Convulsive Status Epilepticus; DRE: Drug Resistant Epilepsy DREE: Dravet-Related Epileptic Encephalopathy; ED: Emergency Department; EPC: Epilepsia Partialis Continua; NCSE: Non-Convulsive Status Epilepticus; PSEE: Post-Stroke Epileptic Seizures; RSE: Refractory Status Epilepticus; SC: Seizure Cluster; SE: Status Epilepticus; SRSE: Super Refractory Status Epilepticus; SUDEP: Sudden Unexpected Death in Epilepsy; TASE: Tumour-Associated Status Epilepticus.

### Reported Outcomes[a]

| | People with SE[9-24] | Seizure Emergencies at the ED[25-35] |
|---|---|---|
| **Demographics** | | |
| Median age (range) | 69 (58–81) | 53.0 (48–60) |
| Male/Female (%) | 50/50 | 55.1/44.9 |
| **Clinical Outcomes** | | |
| Seizure duration (median, hours) | 8 – 51.46 | 20 |
| In-hospital mortality (%) | 13.8 – 31.1 | 0.1 – 3.9 |
| Overall mortality (%) | 6.7 – 46.6 | 1.4 – 8.6 |
| Neurological Sequalae (%) | 3.3 – 11.4 | NR |
| Medical Complications (%) | 40 – 63 | 19.4 – 32.7 |
| **Healthcare Resource Use** | | |
| Hospitalisation rates (%) | 35.4 – 65 | 6 – 32 |
| Hospitalisation median stay (days) | 9 – 24.4 | 8 |
| ICU admission rates (%) | 16.7 – 47.6 | 1.96 – 2.3 |
| ICU median stay (days) | 7 – 13.5 | NR |
| Pre-hospital BZD use (%) | 21.1 – 37.6 | 11.4 – 13.9 |
| In-hospital BZD use (%) | 50 – 85 | 13 – 21.1 |

Notes: [a]Non-exhaustive table, provides outcomes for the two most represented population groups identified in the search. Data are non-weighted averages. SE: seizure duration 6 studies (N 73–360), in-hospital mortality 6 (73–195), overall mortality 7 (40–360), medical complications 5 (65–90), hospitalisation 2 (60–305), hospital stay 3 (77–360), ICU admission 5 (60–360), ICU stay 2 (110–360), pre-hospital treatment 4 (40–360), in-hospital treatment 2 (40–60), neurological sequelae >1 (65). ED seizures: seizure duration 1 (153), in-hospital mortality 2 (153–664), overall mortality 3 (151–489), medical complications 5 (151–489), hospitalisation 7 (151–664), hospital stay 1 (153), ICU admission 2 (153–664), in-hospital treatment 3 (664). | Abbreviations: BZD: Benzodiazepine; ED: Emergency Department; ICU: Intensive Care Unit; NR: Not Reported; SE: Status Epilepticus.

- Analysis centred on clinical outcomes and healthcare resource use; no data available on epidemiology, QoL, or economic impact.
- Only 4 studies (9%) reported paediatric outcomes[34-37], and just 2 (4.4%) included patients >70 years, highlighting underrepresentation of these groups.
- Seizure durations were notably long, ranging from 8 to 51.5h in SE patients, and a median duration of 20h was reported for patients presenting with epileptic seizures in the emergency department.
- Neurological sequelae and medical complications occurred frequently.
- Healthcare resource use was substantial, with long hospitalisations in both groups and often prolonged ICU stays among SE patients.

## Conclusions

- Seizure emergencies linked to high severity, complications, mortality, and significant healthcare use.
- Evidence is fragmented; limited data on economic and quality of life outcomes.
- Reporting of early treatment practices is inconsistent.
- Further cost of illness studies could be conducted in Spain based on the healthcare resources use information found.
- Gaps highlight need for better protocols and awareness of early treatment management.
- Early intervention is key: timely acute medication, patient-friendly administration routes, caregiver/patient education.
- Novel therapeutic strategies for early seizure intervention may reduce escalation and improve outcomes[38].

### References


1. García-Ramos R, et al. Neurología. 2011;26:548–55; 2. Chen Z, et al. JAMA Neurol. 2018;279–86. https://doi.org/10.1001/JAMANEUROL.2017.3949; 3. Feigin CL, et al. Lancet Public Health. 2025;10:e203–27. https://doi.org/10.1016/S2468-2667(24)00302-5; 4. Fazel S, et al. Lancet. 2013;382:1646–54. https://doi.org/10.1016/S0140-6736(13)60899-5; 5. Novak A, et al. J Clin Med. 2022;11:1267. https://doi.org/10.3390/JCM11010267; 6. King-Stephens D, et al. Epilepsy Behav. 2020;112:107374. https://doi.org/10.1016/j.yebeh.2020.107374; 7. Restrepo-Vera JL, et al. Emergencias. 2024;36(3):197–203; 8. Villanueva V, et al. Epilepsy Behav. 2023;147:109384. https://doi.org/10.1016/j.yebeh.2023.109384; 9. Rodrigo-Gisbert M, et al. Epilepsia. 2023;64(9):2399–408; 10. Hidalgo de la Cruz M, et al. Neurologia. 2022;37(7):532–42; 11. Gutiérrez-Viedma Á, et al. Neurol (English Ed.). 2021;37(4):263–70; 12. Requena M, et al. Seizure. 2019;71:289–94. https://doi.org/10.1016/j.seizure.2019.08.013; 13. González-Cuevas M, et al. Eur J Neurol. 2016;23(10):1534–40; 14. Aiguabella M, et al. Seizure. 2011;20(1):60–4; 15. Garcés M, et al. Epilepsy Behav. 2014;36:144–52; 16. Santamarina E, et al. J Neurol. 2013;260(12):3122–8; 17. de la Morena Vicente MA, et al. Neurol (English Ed.). 2017;32(5):284–9; 18. Santamarina E, et al. Epilepsy Behav. 2015;49:138–40; 19. Santamarina E, et al. Seizure. 2017;45:74–9. http://dx.doi.org/10.1016/j.seizure.2016.12.001; 20. Santamarina E, et al. Epilepsy Behav. 2018;89:8–14. https://doi.org/10.1016/j.yebeh.2018.09.046; 21. Vilella L, et al. Acta Neurol Scand.< 2018;137(3):321–8; 22. Fernández Alonso C, et al. Neurologia. 2024;39(1):20–8; 23. Restrepo-Vera JL, et al. Emergencias. 2024;36(3):197–203; 24. Gajate-García V, et al. Neurologia. 2023;38(1):30–5. https://doi.org/10.1016/j.nrl.2020.02.007; 25. Navarro-Pérez MP, et al. Rev Neurol. 2021;72(12):419–25; 26. Requena M, et al. Seizure. 2019;71:289–94. https://doi.org/10.1016/j.seizure.2019.08.013; 27. Fernández Alonso C, et al. Emergencias. 2019;31(2):91–8. http://search.ebscohost.com/login.aspx?direct=true&db=cin20&AN=135202944&site=ehost-live; 28. Fernández Alonso C, et al. Neurologia. 2024;39(1):20–8; 29. Liñán-López M, et al. Rev Neurol. 2019;69(5):181–9; 30. Alonso CF, et al. Emergencias. 2019;31(4):245–51; 31. Fernández Alonso C, et al. Rev Esp Geriatr Gerontol. 2019;54(4):195–202; 32. Olivé-Gadea M, et al. Epilepsy Behav. 2019;92:327–31. https://doi.org/10.1016/j.yebeh.2018.12.008; 33. Fernández-Cabrera A, et al. Rev Neurol. 2024;78(5):121–5; 34. Iglesias-Rodríguez M, et al. Rev Neurol. 2024;79(10):273–7; 35. Moreno Medinilla EE, et al. Rev Neurol. 2015;60(9):394; 36. Vigevano F, et al. Eur J Paediatr Neurol. 2018;22(1):56–63. https://doi.org/10.1016/j.ejpn.2017.07.017; 37. Escribá ACE, et al. Emergencias. 2013;25:116–8; 38. Pina-Garza JE, et al. Epileptic Disord. 2024;26(4):484–97.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