

Forecasting the Prevalence of Status Epilepticus and its subtypes in Europe, 2015–2024

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Introduction

- Status epilepticus (SE) is a life-threatening neurologic emergency with significant morbidity and mortality, defined as continuous or intermittent seizures with incomplete recovery of consciousness. SE may be refractory (RSE) to first- and second-line therapies in ~25% of patients. Approximately 41% of RSE patients suffer from super-refractory SE (SRSE), defined as SE that continues or recurs 24 hours or more after the onset of anesthetic therapy¹.
- There are no published estimates of the prevalence of SE and its subtypes; all available epidemiological data are for disease incidence.

Objective

- The objective of this study is to calculate the prevalence of SE, RSE, and SRSE using an incidence-survival model.

Materials and Methods

- Age-adjusted incidence rates were obtained for each SE etiology²⁻⁴: acute symptomatic, progressive symptomatic, remote symptomatic, and idiopathic/cryptogenic. Incident cases were calculated for each etiology beginning with 1995. Each yearly total was reduced by 16% to account for patients that die within 30 days of their first SE episode.
- Yearly survival data were extrapolated for each SE etiology from a Kaplan-Meier survival curve by Ristić et al (2010)⁴ (Fig 1).

- Prevalence for each etiology was calculated by multiplying the year-specific survival proportion by the age-adjusted incident cases, repeated in an overlapping method from 1995 to 2015, where each year's incident cases are added to prevalent cases carried over from prior years. This was repeated until 2015 in the model, when all year-specific survival proportions were accounted for, and 2015 to 2024 represent a complete estimate of the prevalent population.
- Total SE prevalence was calculated as the sum of each individual etiology prevalence. RSE and SRSE prevalent cases were assessed as proportions of the total number of prevalent SE cases, based on published values.

Results

- The prevalence of SE was calculated to be 18.4 cases per 10,000 population in the EU5, resulting in 590,264 cases in 2015 and increasing to 603,951 cases in 2024.
- The calculated prevalence ranged from 17.2 cases per 10,000 (Germany) to 19.7 cases per 10,000 (Italy).
- Remote symptomatic SE had the highest prevalence, 8.3 cases per 10,000 population, resulting in 266,673 cases in 2015 and increasing to 272,850 cases in 2024. Acute symptomatic SE prevalent cases represented 45.2% of the total prevalent SE cases.
- The prevalence of RSE was 4.5 cases per 10,000 population, resulting in 145,572 cases in 2015 and increasing to 148,572 cases in 2024. SRSE prevalence was 1.8 per 10,000 population, resulting in 59,027 cases in 2015 and increasing to 60,395 cases in 2024.

Conclusions

- To our knowledge, this is the first attempt to calculate the prevalence of SE and its subtypes for all ages in Europe.
- Estimating the prevalence of SE, RSE, and SRSE using population-based epidemiological methods is challenging because of the variability of SE disease definitions and the unpredictable nature of mortality due to SE. This incidence-survival model provides an alternate and effective method to assess the prevalent population.
- Considering the high costs associated with treatment and hospitalization of SE, RSE, and SRSE patients, these estimates are necessary to quantify the burden of disease in Europe.

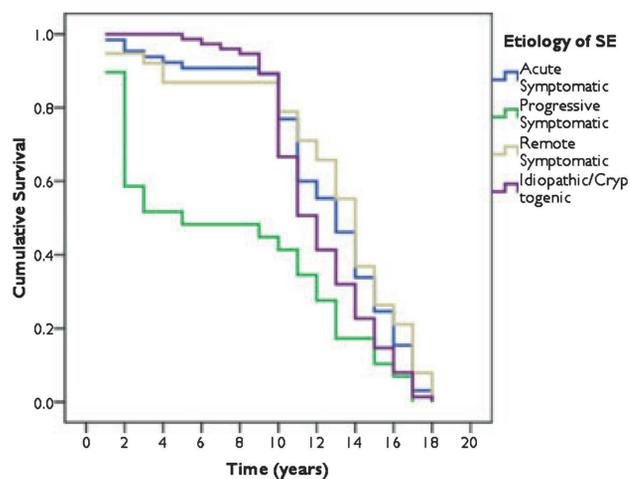


Figure 1. Kaplan-Meier survival curve of SE by etiology, from Ristić et al (2010)⁵.

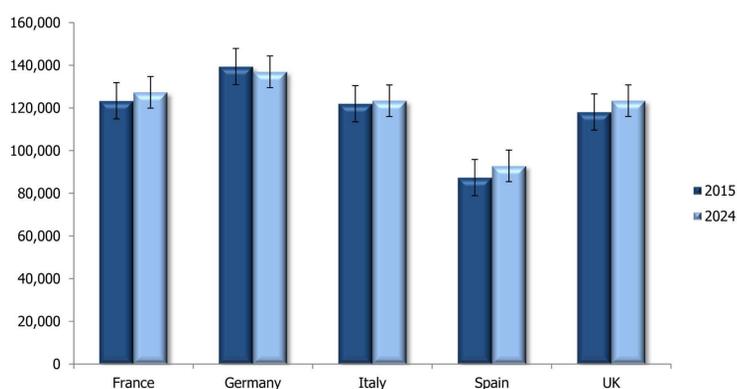


Figure 2. Prevalent cases of SE in the EU5 in 2015 and 2024.

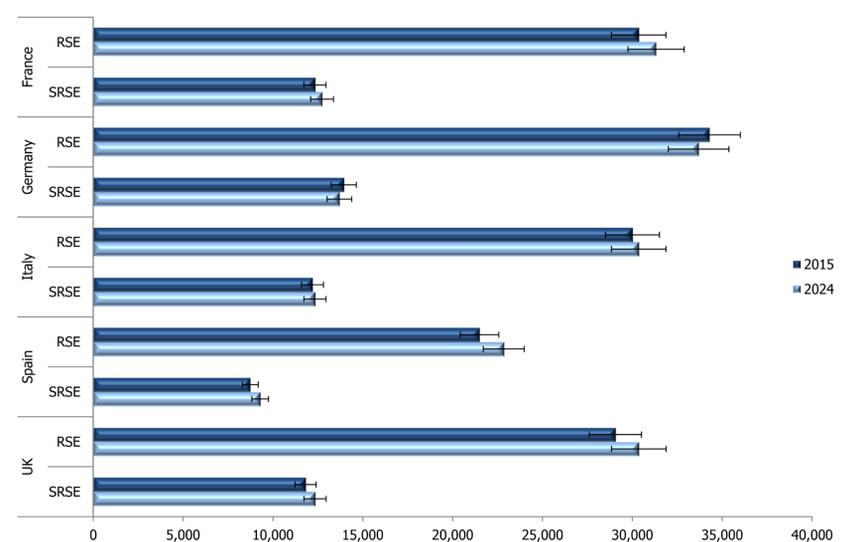


Figure 3. Prevalent cases of refractory (RSE) and super-refractory SE (SRSE) in the EU5 in 2015 and 2024.

	France		Germany		Italy		Spain		UK		EU5	
	2015	2024	2015	2024	2015	2024	2015	2024	2015	2024	2015	2024
Acute Symptomatic SE	41,992	43,333	47,449	46,616	41,505	41,983	29,739	31,605	40,201	42,007	200,886	205,544
Progressive Symptomatic SE	10,980	11,330	12,343	12,126	10,825	10,949	7,798	8,288	10,518	10,991	52,464	53,684
Remote Symptomatic SE	55,723	57,502	63,077	61,970	55,113	55,748	39,420	41,894	53,339	55,736	266,673	272,850
Idiopathic/Cryptogenic SE	14,685	15,154	16,539	16,249	14,536	14,703	10,420	11,073	14,061	14,693	70,241	71,873
Total SE	123,380	127,320	139,408	136,961	121,978	123,383	87,377	92,860	118,120	123,426	590,264	603,951

Table 1. Prevalent cases of SE by etiology in the EU5 in 2015 and 2024.

References:

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