

CHARACTERISING COMMUNITY-BASED PROLONGED SEIZURES AND AUTOMATED SCREENING USING A LARGE LANGUAGE MODEL

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INTRODUCTION

Prolonged seizures increase the risk of progression to status epilepticus, a life-threatening condition associated with long-term morbidity. Early intervention before the tonic-clonic phase may allow seizure termination with rescue antiseizure medications, yet community-based evidence remains limited.

Using a large dataset of at-home video-EEG-ECG recordings, this study characterises prolonged seizures in real-world settings, identifies clinical and sleep-related risk factors, and develops an automated seizure screening method.

METHODOLOGY

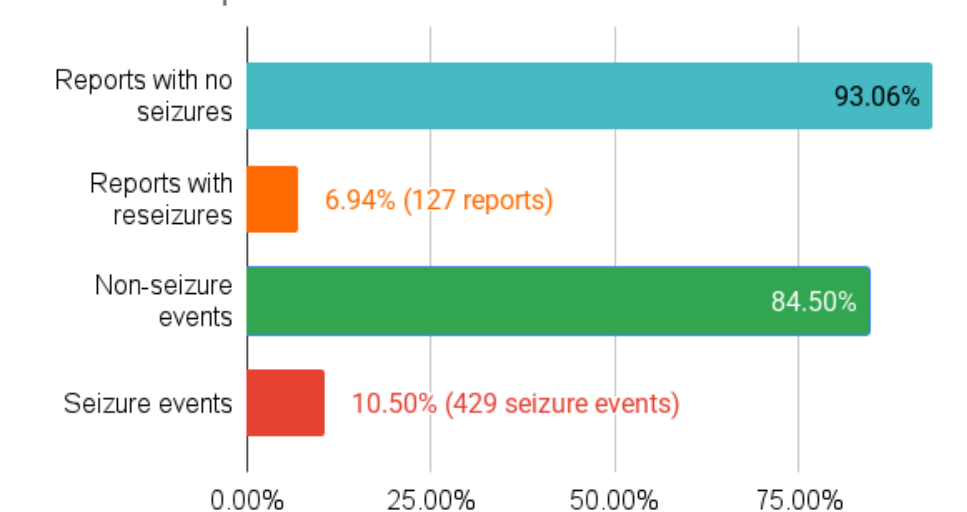
We analysed 1,830 monitoring reports containing 4,096 recorded events, including epileptic and non-epileptic events. To automate event identification, we fine-tuned LLAMA-3.1 using a structured prompt designed to classify events as epileptic seizures and extract duration.

Prompt: “Does this event describe an epileptic seizure? Either clinical or EEG correlation must exist to classify it as a seizure. If yes, extract duration. Respond only with valid JSON. Do not write an introduction or summary. Duration must contain a unit and is a string. There must be 3 fields: is_seizure, event_id, and duration. event_id is a string. is_seizure is either true or false. is_seizure is a string.”

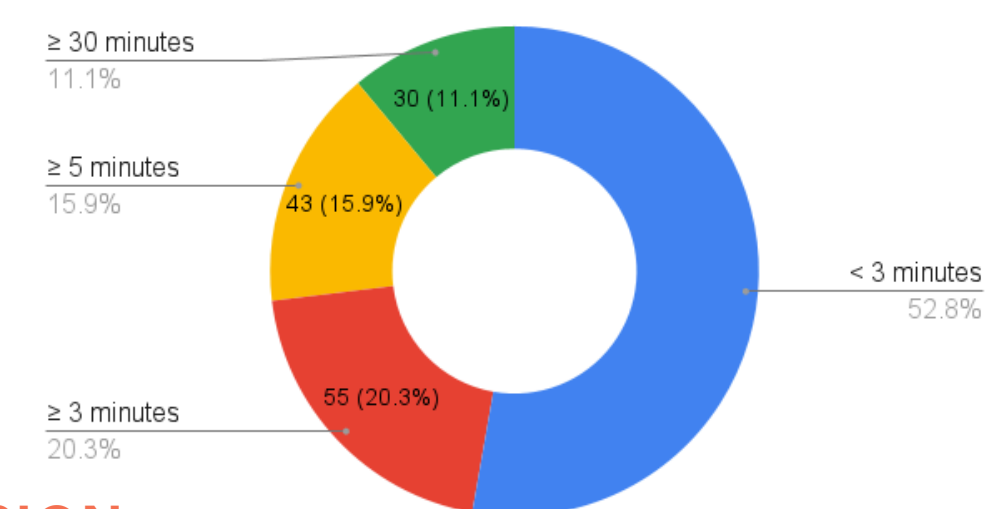
ANALYSIS

Of all reports, 127 (6.94%) contained epileptic seizures, corresponding to 429 seizure events (10.50%). Duration was extractable for 271 seizure events (63%). Among these, 55 events (20.30%) lasted between 3 and 5 minutes, 43 events (15.90%) ≥ 5 minutes, and 30 events (11.10%) ≥ 30 minutes.

Overall reports and events



Seizure duration



CONCLUSION

This work provides one of the largest community-based characterisations of prolonged seizures and demonstrates the utility of LLM-driven text screening. The findings support improved understanding of prolonged seizure patterns and inform future strategies for optimising rescue ASM interventions.

