# Emergency Department Pre-planning for the Surge of Thunderstorm Asthma Patients: A Narrative Review

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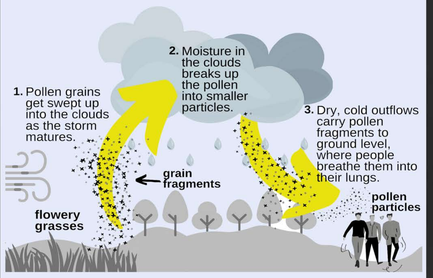
## Aim

To describe the management of TSA across the globe, analyze the limitations of management, and address the potential implications for clinical care and further research.

## Introduction

- **Thunderstorm asthma (TSA)** is an asthma exacerbation following a thunderstorm in the surrounding area.




- Until 2021, there are **26 reported events**.


- **Epidemic TSA** is characterized by **a large number of patients** coming for asthma to local hospital **Emergency Departments (EDs)** or general practitioners.
- **EDs have to be prepared** to increase the surge capacity.
- **Surge capacity is the ability to cope with a sudden influx of large numbers of patients.**

## Methods

**Search Terms**

(thunderstorm asthma OR thunderstorm-related asthma OR thunderstorm-associated asthma), (surge capacity OR emergency surge)

**Data Sources**

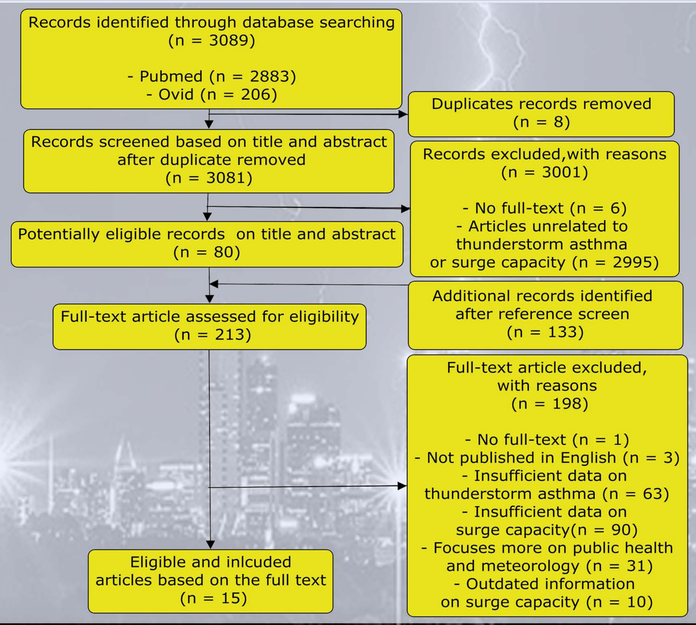
Ovid Medline & Pubmed

**Study Selection Criteria**

All types of articles were included if they were published between 2001 to 2021, discussed TSA and included surge management in the EDs. Articles that were published in languages other than English were excluded along with articles without available full text.

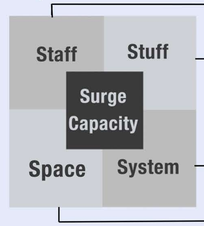
**Additional Data Sources**

The reference lists of all relevant articles were screened for additional relevant studies, including grey literature.




## Results

**Hospital surge capacity comprises 4 domains:**




- Mobilizing more personnel to critical care.
- Preparing disaster supplies: mechanical ventilation devices, personal protective equipment, disease-specific medications prophylactic agents, hemodynamic support and oxygen supplies.
- Establishing disaster and triage protocols.
- Increasing medical treatment space.

**There are 2 innovations that potentially could increase surge capacity during an epidemic TSA**

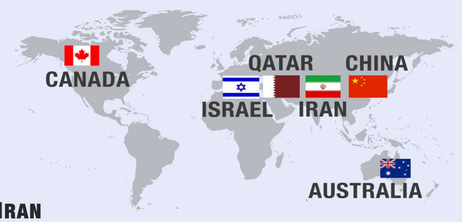
**Reverse triage**

- A study reported a **20% increase in vacant beds** with wards such as plastic surgery, orthopedics, and neurosurgery having the highest potential in reverse triage
- Feizolahzadeh et. al. had developed **a special checklist for reverse triage** that consisted of all criterias deemed necessary for an appropriate early discharge.

**Telemedicine**

Rolston et. al. proposed that **telemedicine has a role for the emergency mass critical care in 3 aspects:** hospital personnel, facilities, and medical logistics.

**Countries that had reported TSA and evaluated in this study**




**IRAN**

- **83,1%** of the patients were administered **oxygen**.
- Asthma drugs that were administered in the ED include **short-acting beta-2 agonist (63,1%)**, **aminophylline infusion (50%), oral corticosteroid (13,5%),** and **corticosteroid injection (40%)**.

**QATAR**

- ED personnel **increased bed capacity**.
- **Shift changes** were done to ED physicians and nurses.

**AUSTRALIA**

- **Call-taking resource** expansion by The Emergency Services Telecommunications Authority.
- Public hospitals **increased their staffs, discharging non urgent inpatients cases.**
- **Activated code brown** to increase surge capacity.

## Conclusion

- The sudden surge of TSA patients poses challenges for medical personnel such as the lack of space for evaluation and treatment, imbalance of staff in comparison to patient demands, and communicating barriers between the regional hospital and government.
- Plans are required to reduce the burden, however the current literature is lacking detail on how to optimally achieve this.
- With a better system and data collection, it is hoped that surge capacity could be improved.

Scan the QR Code for **References and Acknowledgements**

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