

In **disaster management**, statistical concepts like **mean**, **median**, **mode**, and **range** are used to analyze data, identify trends, and make informed decisions about resource allocation, response times, damages, and recovery efforts.

Here's how each concept is used, with **clear examples**:

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## ◆ 1. Mean (Average)

- ◆ **Use:** To find the average number of people affected, items needed, or response time.

### ✓ Example:

A disaster response team recorded the number of people arriving at a shelter over 5 days:

**Data:** 120, 150, 135, 145, 130

$$\text{Mean} = \frac{120 + 150 + 135 + 145 + 130}{5} = \frac{680}{5} = 136$$

- ➡ **On average, 136 people arrived each day.**

Helps plan meals, water, and sleeping space.

## ◆ 2. Median (Middle Value)

◆ Use: To find the middle value when organizing resources or analyzing data that's skewed by outliers.

✓ Example:

The number of emergency calls received each hour over 7 hours:

Data: 42, 39, 45, 30, 51, 48, 36 → Order: 30, 36, 39, 42, 45, 48, 51

$$\text{Median} = 42$$

➡ The **typical number of emergency calls** per hour was **42**, giving a better picture than the average if there's a large spike.

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## ◆ 3. Mode (Most Frequent Value)

◆ Use: To identify the most common need, complaint, or event in a disaster.

✓ Example:

The number of blankets needed per family in a shelter:

Data: 2, 3, 2, 4, 2, 3, 5

$$\text{Mode} = 2$$

➡ **2 blankets per family** was the most common need, so relief teams can prioritize that amount when packing supplies.

## ◆ 4. Range (Spread of Data)

- ◆ Use: To understand the variation in damages, response times, or supply usage.

### ✓ Example:

Temperatures recorded in 5 different shelters during a cold front:

Data: 8°C, 12°C, 10°C, 15°C, 9°C

$$\text{Range} = 15 - 8 = 7^\circ C$$

- ➡ Temperature **varies by 7°C**, so some shelters may need **extra heating** or insulation.

### ✓ Summary Table:

Concept	Use in Disaster Management	Example	Result
Mean	Average shelter arrivals	120, 150, 135, 145, 130	136 people/day
Median	Typical emergency call rate	30, 36, 39, 42, 45, 48, 51	42 calls/hour
Mode	Most common blanket need	2, 3, 2, 4, 2, 3, 5	2 blankets
Range	Difference in temperature	8°C – 15°C	7°C range

These tools help disaster managers:

- Estimate needs quickly
- Understand data distribution
- Spot trends and prepare better
- Avoid over- or under-supplying