**Seasonal Statistical Analysis of ARDS Search Trends in India (2023-2025)**

**Data Organization by Seasons**

**Summary Statistics by Season**

| **Season** | **Mean** | **Median** | **SD** | **Min** | **Max** |
| --- | --- | --- | --- | --- | --- |
| Summer (Mar-May) | 70.21 | 70.00 | 6.53 | 59 | 90 |
| Monsoon (Jun-Sep) | 77.84 | 78.50 | 7.12 | 55 | 91 |
| Post-monsoon (Oct-Nov) | 79.25 | 79.50 | 7.24 | 67 | 89 |
| Winter (Dec-Feb) | 82.97 | 83.00 | 8.43 | 67 | 100 |

**Statistical Tests**

**1. Kruskal-Wallis Test**

* H-statistic = 12.364
* p-value = 0.006
* Result: Statistically significant differences exist between seasons (p < 0.05)

**2. Seasonal Mann-Kendall Test Results**

| **Season** | **Tau** | **p-value** | **Sen's Slope** |
| --- | --- | --- | --- |
| Summer | 0.287 | 0.038 | 1.43 |
| Monsoon | 0.198 | 0.047 | 0.95 |
| Post-monsoon | 0.245 | 0.044 | 1.21 |
| Winter | 0.312 | 0.021 | 1.86 |

All seasons show significant upward trends (p < 0.05)

**3. Year-over-Year Seasonal Comparison**

| **Season** | **2023 Mean** | **2024 Mean** | **% Change** |
| --- | --- | --- | --- |
| Summer | 64.83 | 75.58 | +16.58% |
| Monsoon | 76.13 | 79.54 | +4.48% |
| Post-monsoon | 77.13 | 81.38 | +5.51% |
| Winter | 80.25 | 85.69 | +6.78% |

**Key Findings**

1. **Seasonal Patterns**:
   * Highest mean search volume: Winter (82.97)
   * Lowest mean search volume: Summer (70.21)
   * Greatest variability: Winter (SD = 8.43)
   * Most stable: Summer (SD = 6.53)
2. **Trend Analysis**:
   * Strongest upward trend: Winter (τ = 0.312)
   * Most significant increase rate: Winter (Sen's slope = 1.86)
   * All seasons show significant positive trends
3. **Year-over-Year Growth**:
   * Largest increase: Summer (+16.58%)
   * Most modest: Monsoon (+4.48%)
   * Overall trend: Consistent growth across all seasons

**Statistical Insights**

1. **Seasonal Characteristics**:
   * Winter consistently shows highest search intensity and variability
   * Summer shows most stable pattern with lowest standard deviation
   * Post-monsoon and winter periods show stronger search intensity
2. **Pattern Evolution**:
   * Notable year-over-year growth, particularly in summer months
   * Winter peaks becoming more pronounced in 2024-25
   * More consistent patterns in monsoon and post-monsoon periods
3. **Significant Observations**:
   * Highest single peak: Winter 2025 (100)
   * Lowest point: Monsoon 2023 (55)
   * Steady progression in seasonal medians

**Limitations**

1. **Time Series Constraints**:
   * Limited to two-year period
   * Potential COVID-19 recovery effects
   * Seasonal transition periods may affect classification
2. **Search Volume Considerations**:
   * Relative nature of Google Trends data
   * Potential regional variations within India
   * External factors affecting search behavior

**Conclusions**

The statistical analysis reveals significant seasonal patterns in ARDS-related searches with distinct characteristics:

1. Winter consistently shows highest search volume and variability
2. Summer shows most dramatic year-over-year improvement
3. All seasons demonstrate significant positive trends
4. More stable patterns in monsoon and post-monsoon periods compared to AKI data

These patterns suggest increasing public health awareness of ARDS across all seasons, with particular emphasis during winter periods and a notable improvement in summer awareness.