

The size of college football stadiums and the towns they are in: are all towns equipped for college football mass gatherings?

Avery Nobles^{1*}, Emma Redman^{1*}, Ashley Hawthorne², Dominick Lemas³, and Matthew Loop⁴

¹Auburn University Harrison College of Pharmacy PharmD Candidate, ²Department of Pharmacy Practice Harrison College of Pharmacy ³University of Florida College of Medicine, ⁴Department of Health Outcomes Research and Policy Harrison College of Pharmacy
*Authors contributed equally

Study Design

Question: How do characteristics such as stadium size, municipal resources, and proximity to emergency departments vary among municipalities with "Power 5" football programs?

Sampling strategy: Collected publicly available data in 2023 for 69 college/university municipality pairs.

Identified municipalities were associated with "Power 5" football programs encompassing the:

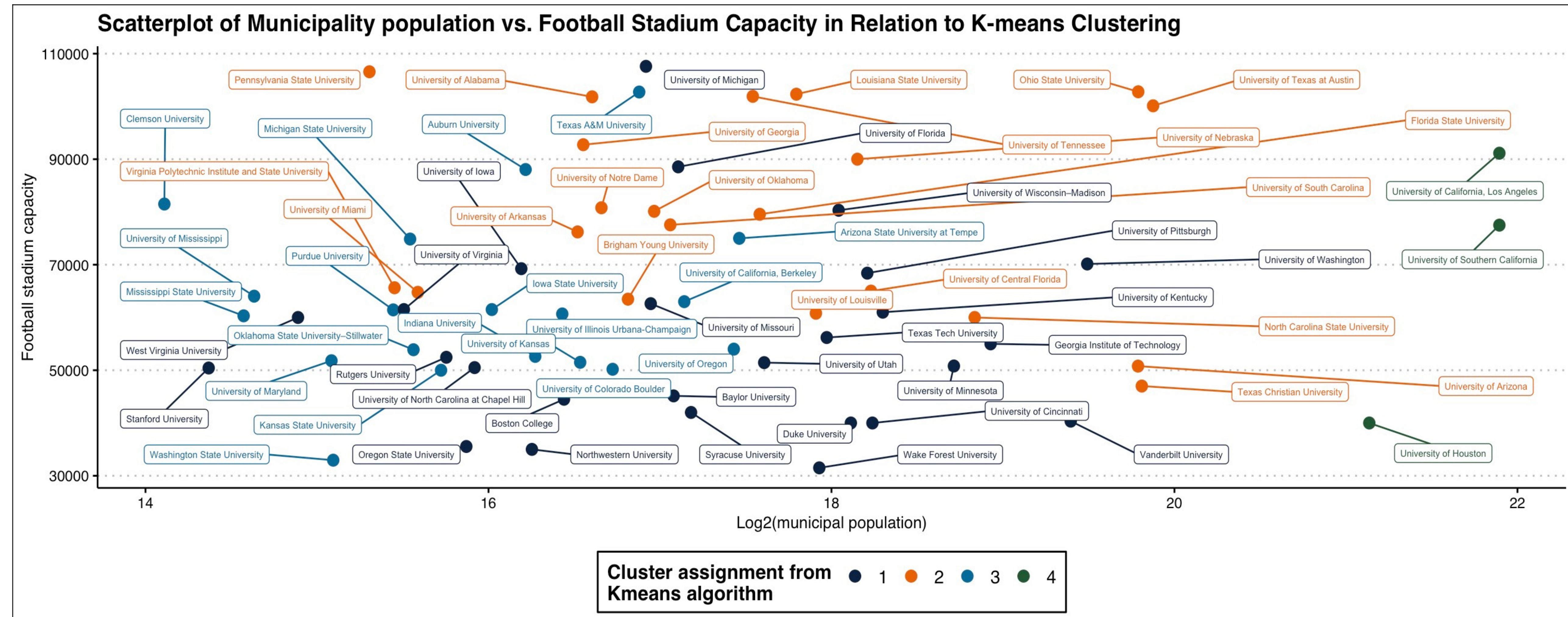
- Southeastern Conference (SEC)
- Big 12
- Big 10
- Pac-12
- Atlantic Coast Conference (ACC)

Statistical Analysis

Descriptive analysis utilizing means, medians, quartiles and percentages.

K-means clustering was utilized to group municipalities by specific factors:

- Stadium size
- Municipality size
- Distance from the football stadium to closest ED
- Whether there was an academic hospital in the municipality or not
- Whether closest ED is freestanding or not
- Whether closest ED has ACC Chest Pain Accreditation/Certification or not



| Characteristic | 1, N = 26 | 2, N = 21 | 3, N = 19 | 4, N = 3 |
|--|------------------------------|------------------------------|-----------------------------|-------------------------------------|
| 2023 Football Conference | | | | |
| ACC | 8 (31%) | 5 (24%) | 1 (5.3%) | 0 (0%) |
| Big 10 | 6 (23%) | 3 (14%) | 5 (26%) | 0 (0%) |
| Big 12 | 4 (15%) | 5 (24%) | 4 (21%) | 1 (33%) |
| Independent | 0 (0%) | 1 (4.8%) | 0 (0%) | 0 (0%) |
| Pac-12 | 4 (15%) | 1 (4.8%) | 5 (26%) | 2 (67%) |
| SEC | 4 (15%) | 6 (29%) | 4 (21%) | 0 (0%) |
| Football stadium capacity | 51,949 (42,625, 62,341) | 79,560 (64,767, 100,119) | 60,670 (52,214, 69,452) | 77,500 (58,750, 84,318) |
| Population size | 144,853 (75,649, 298,105) | 190,740 (99,627, 307,573) | 66,427 (39,792, 101,592) | 3,898,747 (3,101,664, 3,898,747) |
| Distance to nearest ED (miles) | 1.15 (0.73, 1.98) | 3.50 (2.40, 4.80) | 2.20 (1.65, 3.65) | 3.00 (2.75, 5.35) |
| Closest ED is free standing | 1 (3.8%) | 2 (9.5%) | 3 (16%) | 0 (0%) |
| Closest ED has ACC Chest Pain Accreditation or Certification | 4 (15%) | 9 (43%) | 9 (47%) | 1 (33%) |
| Number of beds in closest ED | 58 (44, 74) | 50 (34, 53) | 23 (20, 30) | 50 (50, 50) |
| Unknown | 15 | 10 | 11 | 2 |
| Teaching hospital in municipality | 26 (100%) | 21 (100%) | 0 (0%) | 3 (100%) |

Results

Median (quartile 1, quartile 3) football stadium capacity was 62,061 seats (51,576, 79,985)

Conference with the smallest median stadium capacity: Pac-12 (52,722)

Conference with the largest median stadium capacity: Southeastern Conference (82,801 seats)

Summary of four cluster analysis:

- "Academic hospital" cluster 1 (n=26)
- "Large teaching hospital" cluster 2 (n=21)
- "Rural" cluster 3 (n=19)
- "Large municipality" cluster 4 (n=3)

Conclusion

Municipalities in the "rural" cluster characterized by larger football stadium capacities, potentially bear the most significant "stress," or difficulty in providing emergency medical services to those in the communities. This highlights the importance of targeting emergency preparedness efforts in these municipalities during football gatherings.