Demographics, Distance, and Sport Facility Usage: A Westminster Case Study

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Introduction

Within Westminster, obesity rates are high and the physical activity of some demographic groups is low. With the risks of physical inactivity abundantly clear for national and local governments, Westminster is in the process of introducing innovative, procedural changes to encourage physical activity.

In addition to parks and sport participation, sport and fitness facilities are a vital aspect of physical activity. With eight council-run facilities in the borough (Figure 1), it is crucial that Westminster understands the demographic backgrounds of their sport and fitness users. Knowledge of the target communities allows tailored engagement and goal setting.

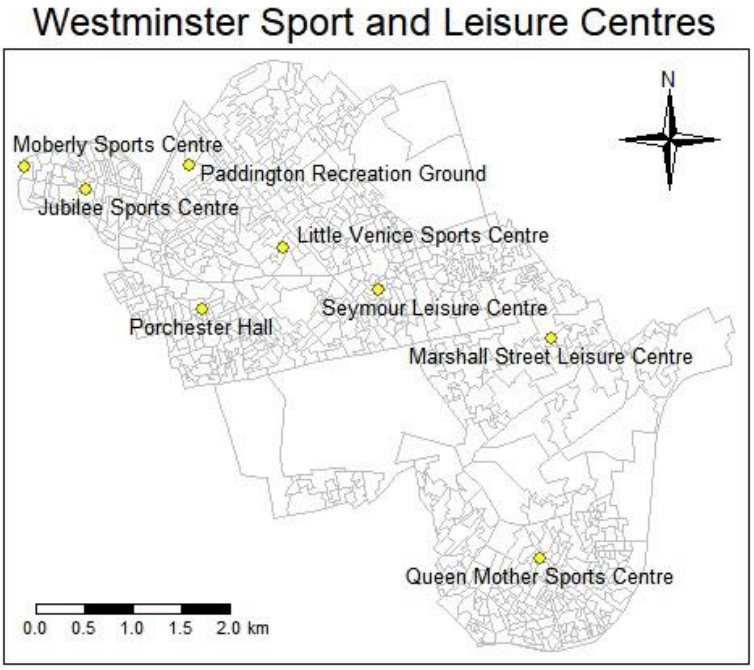

Figure 1 - Map of facility locations

The study explored sport and fitness centre usage within Westminster with a focus on user demographics and location. In identifying demographic and spatial aspects of sport and fitness centre usage, Westminster can make data-driven decisions on where, when, and how to dedicate finite resources to engage the most critical communities of the borough.

Data Sources

The two main datasets used in the study were provided by Westminster. The primary data was the transaction level sport and fitness centre visitations collected by *Everyone Active.* The anonymised data included nearly 1.4 million visitations to the eight council-run sport and leisure centres in the borough between June 8, 2016 – August 31, 2018.

The second dataset was the Acorn geodemographic segmentation data that the borough possesses. The data classifies the UK population into demographic types at a neighbourhood level by combining geography and demographics to characterise household type into six categories, 18 groups, and 62 types.

Additional, complementary datasets were drawn from the UK Office for National Statistics (population and demographic) and the Ordnance Survey (geographic).

Approach and Methods

The primary objective was to assist Westminster in understanding the users of their council-run sport facilities. To investigate the spatial and demographic characteristics of usage, three research questions were developed:

1) What are the demographic and temporal patterns of the City of Westminster's sport and fitness centre users?
    - Method: A descriptive data analysis was performed on the *Everyone Active* sport centre and Acorn geodemographic data. The data was limited to unique user visits (no duplicates). This relates to 101,847 individuals that used a facility in the study timeframe.

2) Are there spatial clusters of sport and fitness centre users within the City of Westminster?
    - Method: To identify any statistically significant cluster patterns of facility usage, an exploratory spatial data analysis was performed through autocorrelation tests. These tests only analysed Westminster residents (62,052 users). Users were aggregated to output area (OA) level and a "usage rate" metric was calculated. Usage rate is the percentage of population in each OA that used a facility.

3) What spatial and demographic factors influence the sport and fitness centre usage rates in the City of Westminster?
    - Method: To investigate the influence of distance and demographics on usage rates, a suite of spatial interaction models (SIMs) were developed. The SIMs allowed us to investigate which facility users travel the furthest to use, measure the influence of OA geodemographic factors, and measure the influence of distance on usage.

Main Outcomes

1. Existing Demographic and Temporal Patterns of Usage

Each facility has unique demographic and temporal patterns. Only the overall facility patterns are discussed below. For in-depth examination of the individual facilities, please review the demographic sections of the full study.

Demographically, facility users were younger (32 years old) than the Westminster average (34), mostly male (52.13%), and from low-to-mid socio-economic groups (Figures 2-5). Teenage boys were greater users than girls, but women in their 20's were greater users than their male counterparts. Individuals between 16-64 years old made up 80.31 percent of users. Geodemographically, most users came from the Acorn *Rising Prosperity* (54.64%) category followed by *Urban Adversity* (30.42%).

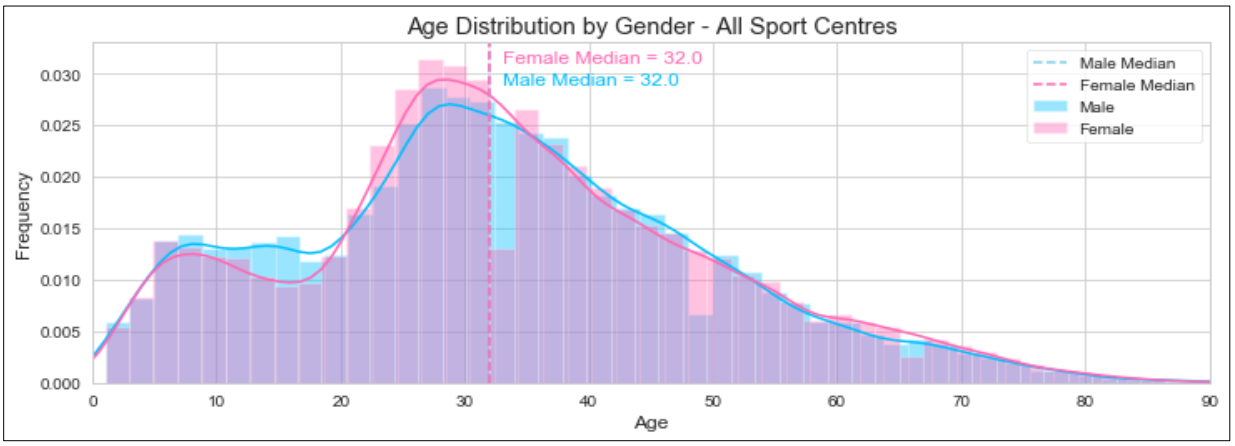

Figure 2 - Age distribution by gender

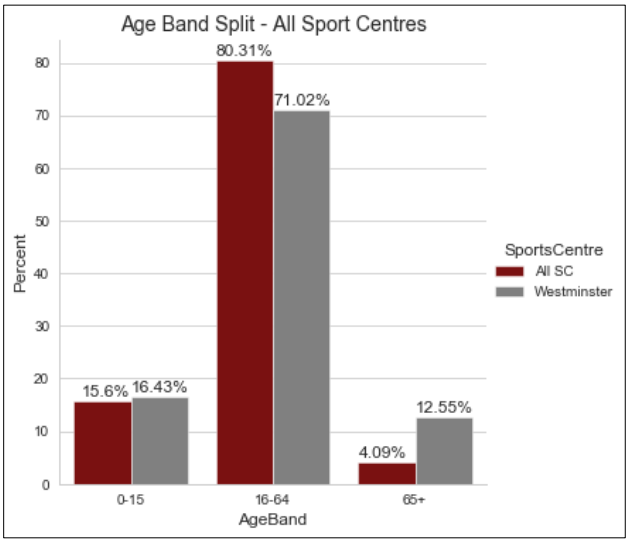

Figure 3 - Facility users by age band

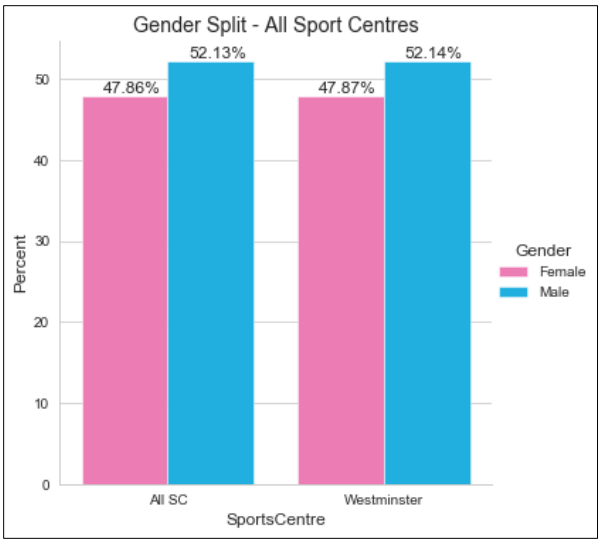

Figure 4 - Facility user gender split

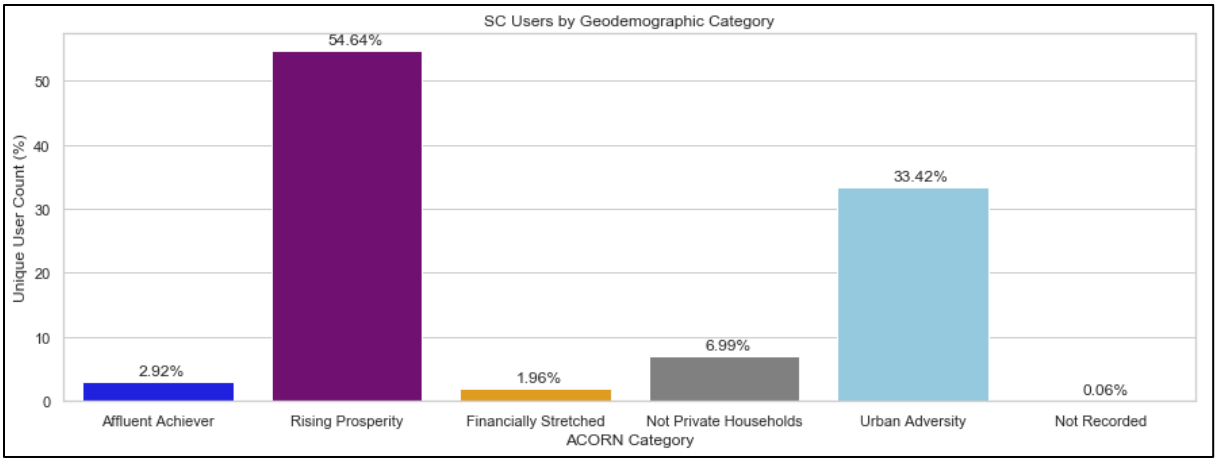

Figure 5 - Acorn geodemographic category split

Temporally, monthly usage showed a steady, if marginal, increase over the study period with spring and summer months the busiest and a clear usage drop in December each year (Figure 6). Midweek was the busiest (Tuesday and Wednesday) while weekends were the least busy (Figure 7).

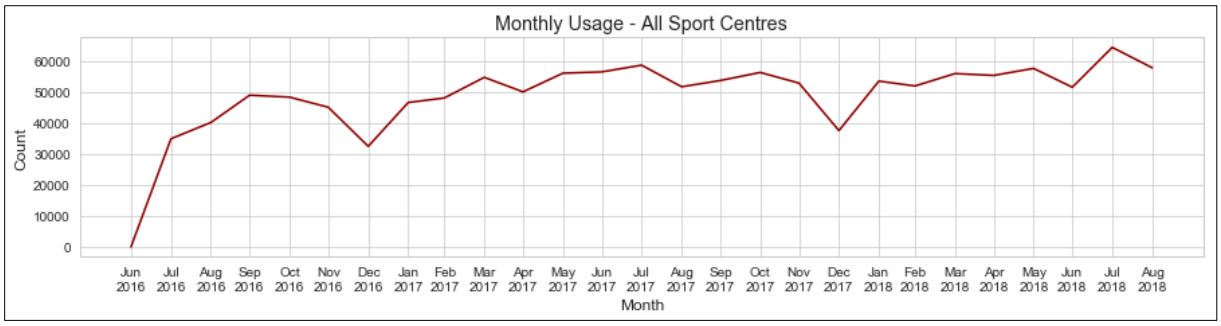

Figure 6 - Monthly usage throughout study period

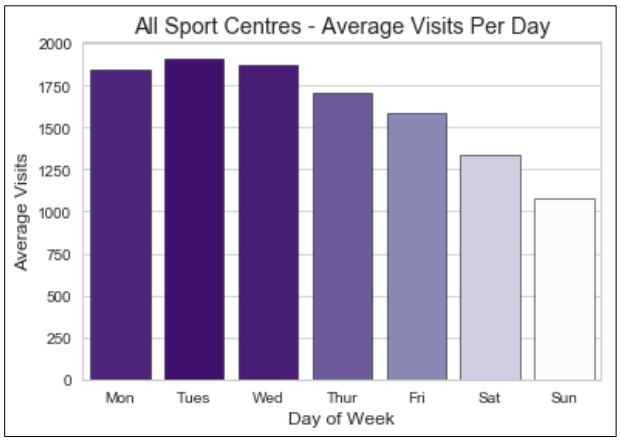

Figure 7 - Weekly usage by day of week

Daily weekday usage had three peaks – 7:00, 12:00, and 16:00 to 18:00 (the greatest peak by over one-third). Weekend usage peaked at 10:00 before slowly declining throughout the rest of the day (Figure 8).

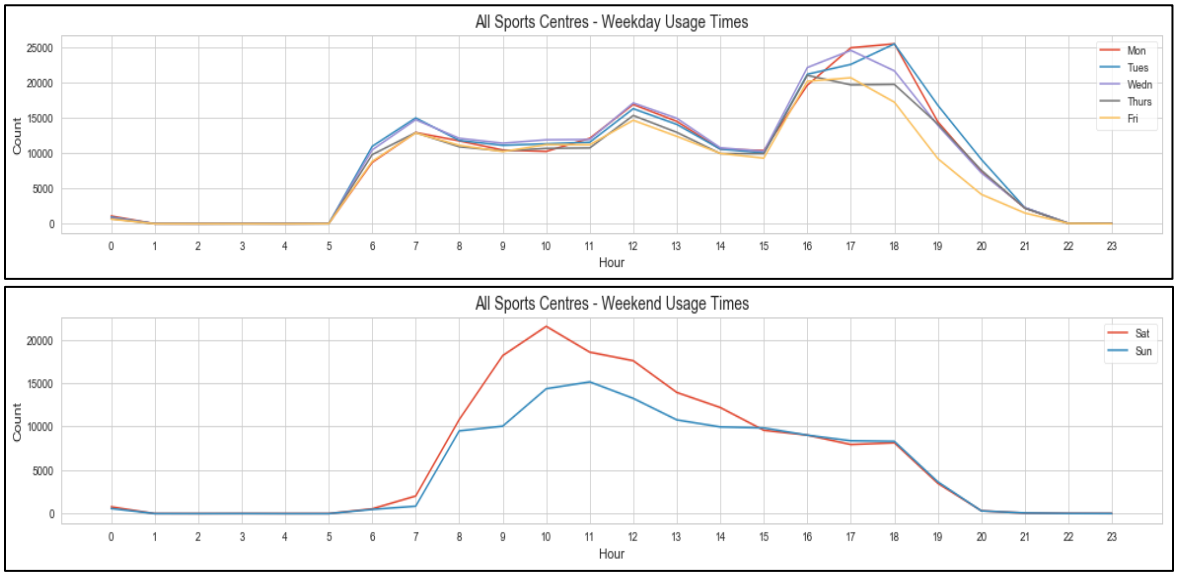

Figure 8 - Daily usage by hour. Weekday (top) and weekend (bottom).

2. Sport Facility Usage is Clustered

Usage of the facilities was not distributed evenly or randomly. All autocorrelation tests identified statistically significant clustering of users. One test (Getis Ord Gi*) spatially identified clusters of high usage rates and low usage rates, clearly indicating that high usage rates were near facility locations, while low usage rates were distant from facilities (Figure 9).

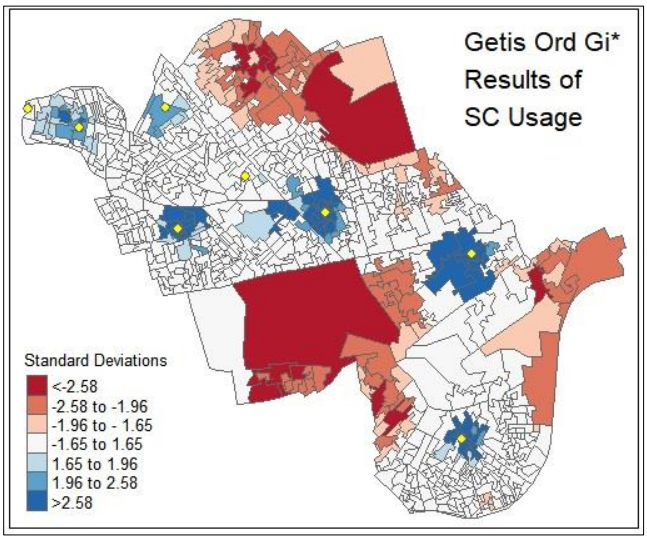

Figure 9 - Clusters of high usage rates (blue) and low usage rates (red)

3. Distance to Sport Facility is Critical

All facilities exhibited negative distance decay measures – as distance to a facility increases, users from that OA decline. Distance was predominantly and significantly the greatest predictor of facility usage, with usage the greatest amongst residents near a facility (Figure 10).

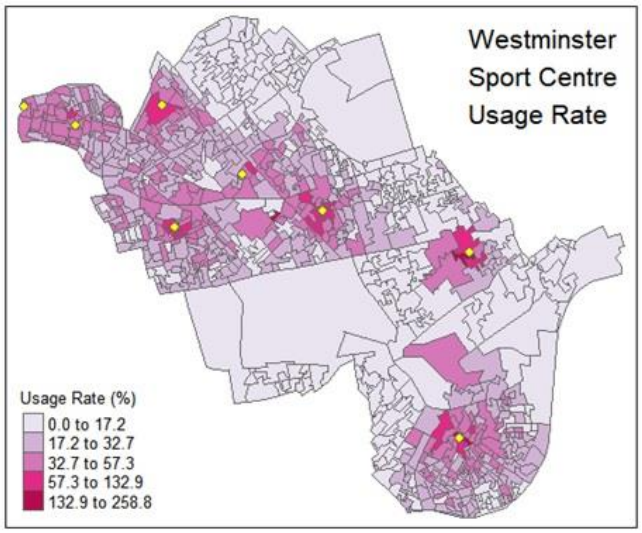

Figure 10 - Usage rate by OA

Moberly SC was identified as the facility that users were prepared to travel the furthest to use. The result may be related to Jubilee SC's closure and the possibility that Jubilee users chose to travel slightly further to Moberly. Marshall Street LC had the greatest distance decay, with users least likely to travel a far distance to visit.

4. Disadvantaged Groups Are Important Users

In predicting facility usage, lower socio-economic and ethnically diverse demographics were positive influential factors. This is important – many academic studies find these groups to be the least healthy and unfit. If Westminster is engaging these groups through sport facility usage, then it is on a good path of combatting inactivity in the borough.

Limitations

- Study outcomes identify correlates of facility usage, but don't explain the causation. Substantial academic research has highlighted the difficulty in finding determinants of physical activity.

- Aspects of the *Everyone Active* facility data was poor. Several thousand records were missing details (age, gender, postcodes), and the ethnicity data was particularly untrustworthy. Although not used in this study, the "activity type" data was also unreliable.

- Analysis was restricted to facility users rather than broader physical activity patterns due to the lack of available data related to park usage and sport participation. As such, areas of low facility usage may engage in other physical activities or visit facilities outside of Westminster.

Recommendations

- Distance is *the* key predictor of facility usage. Any policies or campaigns to increase facility-based activity must involve distance considerations. Encouraging usage should begin at the neighbourhood-level of facility locations. Perhaps reducing or waiving rates for “neighbourhood” residents would see usage increases.

- Tailor facility programs to the demographics that visit them. Each facility exhibits slightly different demographic and temporal usage and “one size fits all” programming may not be appropriate. Initiatives and events should be customised to the type of user at each location.

- The number of users coming from traditionally marginalised backgrounds (low socio-economic levels and minorities) is encouraging. Research indicates these groups are conventionally the least physically active, and Westminster should continue to foster ties with these groups to combat physical inactivity.

- Improve the *Everyone Active* data collection. Stronger activity type data could be incredibly powerful for program planning and understanding when and where certain activities are popular with specific demographics. Additionally, quality data on user ethnicity would help with insights.