



Mapping Sport Participation Pilot Project: Row Ontario

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The following report summarizes the findings from a pilot project examining ways in which sport participation data can be spatially analyzed. The research was conducted in partnership with Row Ontario and with financial support from the Sport Information Research Centre's Research Practitioner Match Grant. The purpose of the pilot study is to develop a methodology for describing and analyzing the geography of sports participation over time. We use membership data provided by Row Ontario to examine locational and historical trends for the sport of rowing in Ontario for the six seasons between 2014 and 2019. The pilot study pays particular attention to the influence of gender on participation.

The following report lays out some background for the project, how data were collected and analyzed, and some of the insights that spatial analyses of sport participation might provide. These findings may be useful to help understand participation trends related to gender as well as a range of other demographic markers. In particular, these analyses may be particularly useful for researchers and practitioners who are interested in processes associated with regional sport development and policy implementation from a critical and/or geographic perspective.

Thank you to Andrew Backer and the folks at Rowing Ontario for their support with this project. Without your willingness to share your insights and discuss these findings as they evolved, this project would not have been possible.

Anyone who is interested in these findings or learning more about this research project can reach out to Kyle Rich at the coordinates listed below.

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Background

Very little research to date has examined sport participation or development from a geographic perspective. Where the work does exist, sport is often discussed in relation to a sense of place, experiences in space, or issues related to travel and tourism. Although there is a growing body of research looking at sport participation in Canada, to our knowledge, this work has not examined the geography of sport participation or how sport policy implementation varies in relation to geography (e.g., differences in development strategies between rural, suburban, and urban locations).

Broadly, the literature indicates that rural areas face unique issues related to organizational capacity, access to transportation, and the gendered nature of work and leisure opportunities; suggesting that rural Canadians generally, and rural women and girls more specifically, may experience constraints to sport participation differently than other demographic groups. While suburban areas tend to have fewer amenities, they benefit from easier access to resources based on their proximity to urban centres. Urban centres, with higher population densities and often more competitive and recreational sport participation opportunities may be sites of greater disparity. As a result, citizens in those regions may experience different types of issues and inequities related to accessing sport participation opportunities.

Most national and provincial sport organizations are located in large cities along-side the most competitive sport participation opportunities. However, it is unclear if sport development initiatives are uniformly effective across diverse community contexts or how geography may shape effectiveness of recruitment or retention strategies. As such, we do not know if system-wide trends are experienced the same way by all clubs, regardless of where they are located, or if these trends differ between rural, suburban, and urban locations. Likewise, we don't know how these trends might vary by kind of location. Further, we don't know what management or policy approaches are effective in increasing sport participation for diverse participants or community contexts.

The purpose of this project is to provide a geographical perspective to sport development in order to understand trends in sport participation in diverse community contexts. This analysis allowed us to map participation data with regard to age, gender, and rural/urban status. Effectively, we examined if and how women and girls in diverse community contexts are accessing sport participation opportunities within the context of rowing in Ontario.



Methodology & Findings

In order to conduct this analysis, we used a variety of methodological tools. First, sport participation data was collected for the province of Ontario. Data included date-of-birth, gender, address (including postal code) for all participants registered with Row Ontario from 2014-2019 inclusively. After these data were 'geo-coded' (i.e., the latitude and longitude of each members' and clubs' postal code or address, respectively, were determined) and ages calculated from date-of-birth. This initial step provided us with a broad picture of the demographics of participants registered with the Provincial Sport Organization (PSO).

Figure 1. Total Row Ontario Members 2014-2019

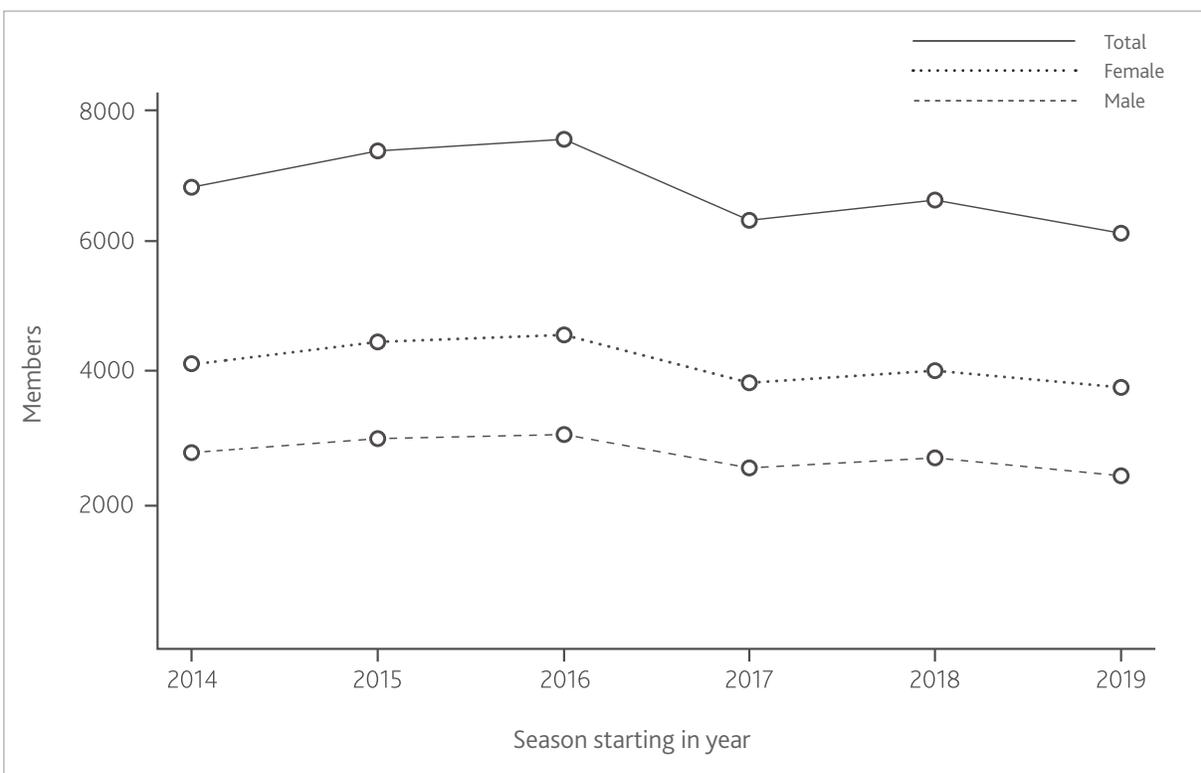
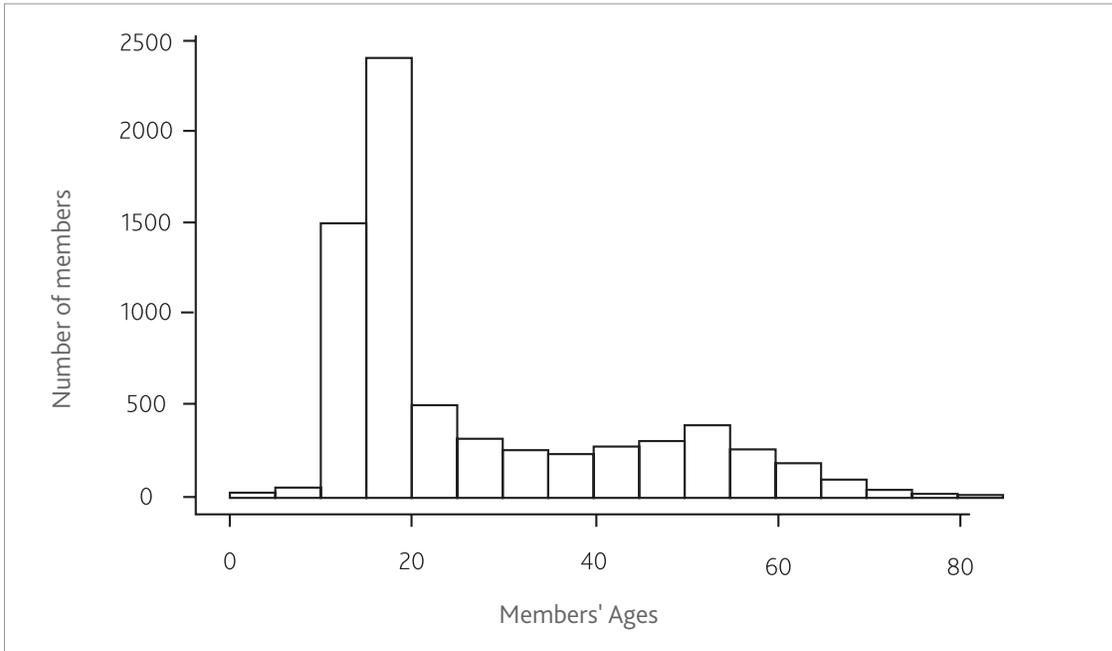


Figure 1 provides one example of this demographic data, showing the total membership of Row Ontario over this six-year period. The main point is that around 60% of members are female in any given year, and that there is a slight decline in membership over the six years. However, this decline is not secular (i.e., declining every year), but instead fluctuating.

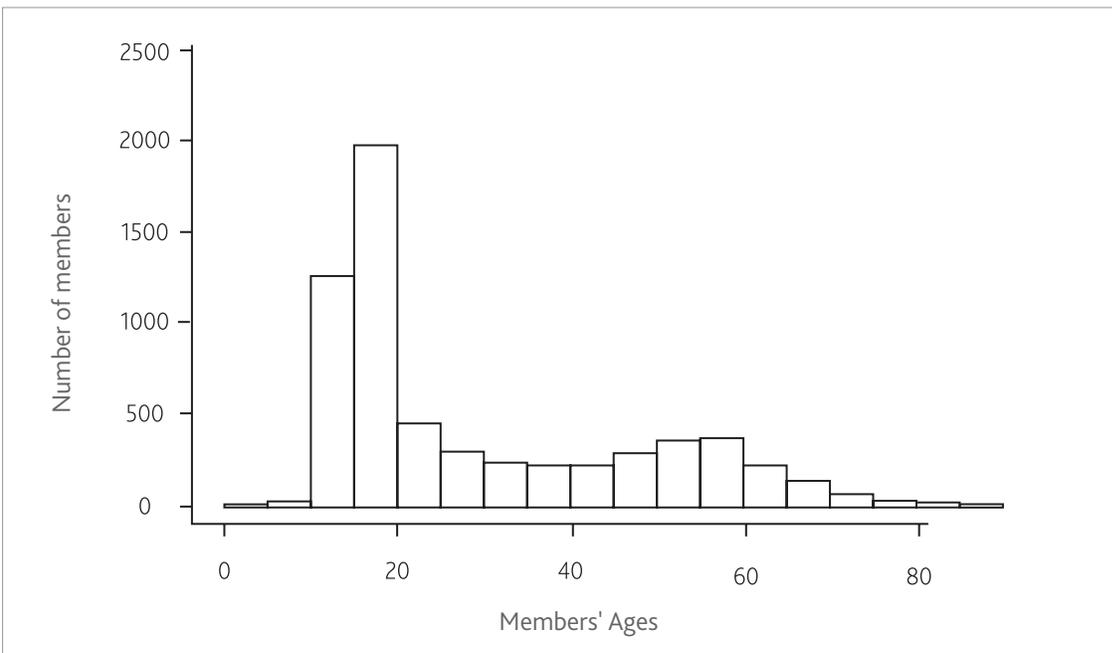
Figure 2 contains a second example of demographic trends gleaned from the Row Ontario data. This histogram sorts members into five-year 'age-cohorts' (i.e., groups). This histogram tells us that the largest share of members are in the 15-19 group followed by the 10-14 group. Nonetheless, there are still close to 3,000 members 20 years and older.

Figure 2. Age structure of all Row Ontario Members, 2014.



When we compare Figure 2 with Figure 3, we see that while there are fewer members in the two teenage groups of 10-14 and 15-19, the general age structure for later years remains similar to that in 2014.

Figure 3. Age structure of all Row Ontario Members, 2019.



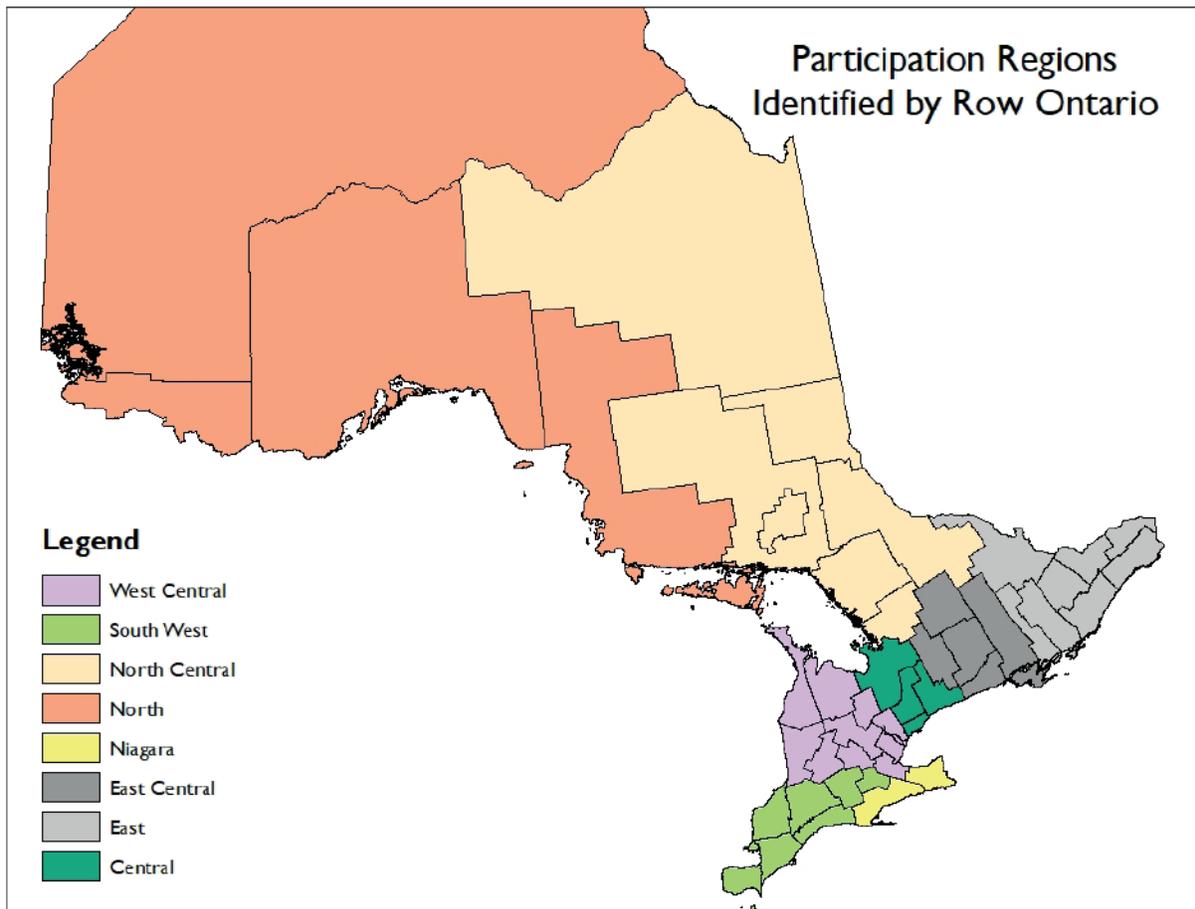
While not included in this report, these two figures can also be re-drawn to show histograms for each gender. Alternately, these data could also be displayed as population pyramids, showing the age-sex structure of males and females. Again, for brevity we have not included these here.

Data analysis then proceeded in two phases.

Phase 1: Mapping

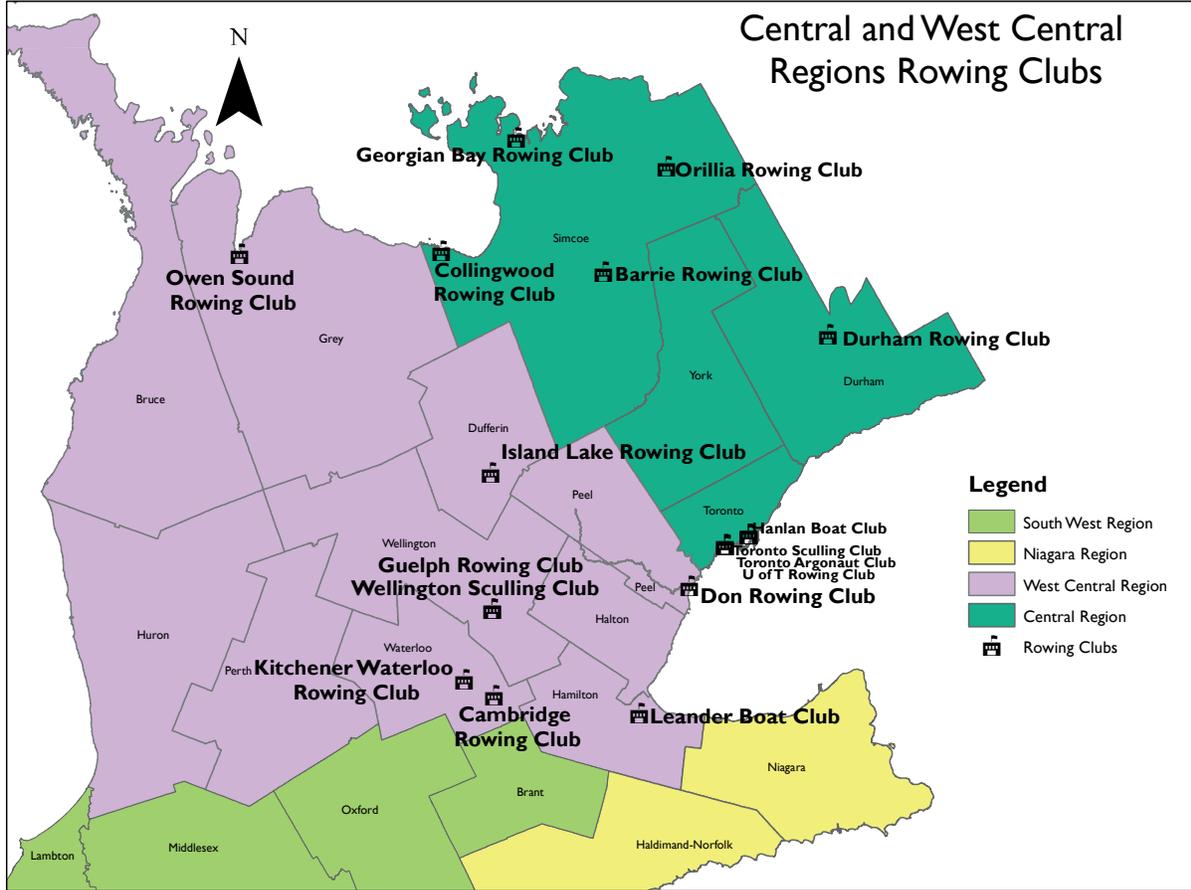
In order to map the participation data, we first identified regions of the province which will be extremely helpful for Row Ontario to implement strategies within its strategic plan. Recognizing that different sports have unique regions which are meaningful for various reasons, this process was important for ensuring that the analysis was functional for Row Ontario. Rough regions were identified by Row Ontario and boundaries were finalized based on census subdivisions (CSDs). CSDs are regions used by Statistics Canada that, in Ontario, correspond to municipalities.

Figure 4. Functional Regions identified by Row Ontario



Next, we used ArcGIS to map rowing clubs as well as their participants by postal code. This allowed us to visualize not only where participants were located, but also the trends in participant demographics in the various regions. Doing so provided a visualization of participation demographics in each region. From these visualizations, we were able to analyze some short- and long-term trends in participation data.

Figure 5. Rowing Clubs in the Central and West Central Regions



Mapping the club and participants locations across the time period allowed us to observe the trends in participation across time and space. These trends are associated with both age (i.e., the colour of the plots) as well as the gender of participants, as shown in Figure 6. Additionally, these visualizations allowed us to observe the - sometimes surprising - distances that participants were located from their respective clubs.



Figure 6. Female and Male Participation Maps 2014-2015 Season

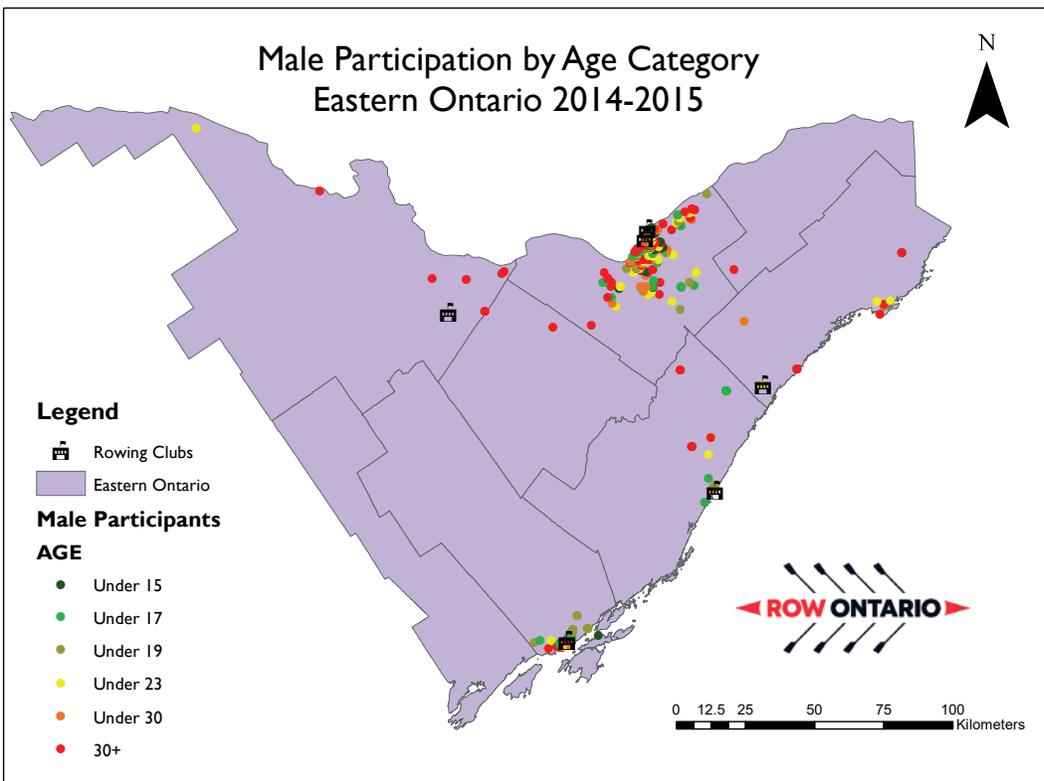
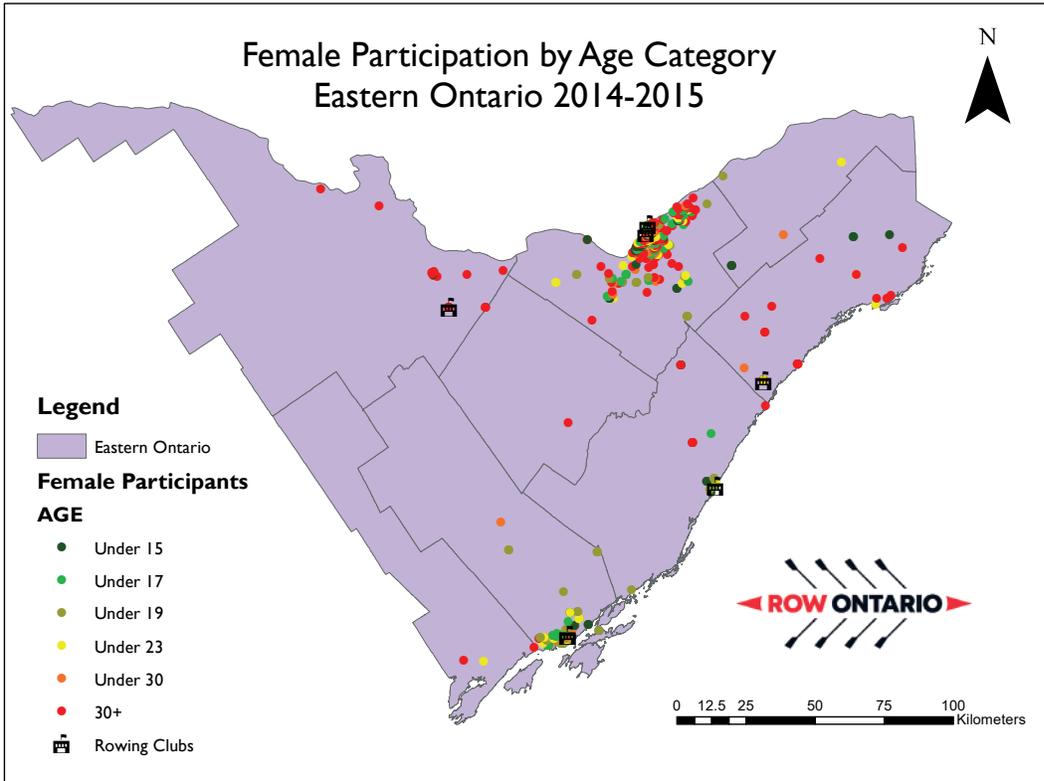


Table 1. Rowing Clubs on Ontario

	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20
Number of Clubs	51	51	52	51	50	53

While mapping the membership data, we also realized that while there were 59 Row Ontario clubs in operation over the six years, the most in operation in any one year were 53, in the 2019-20 season. These trends are apparent in **Table 1**. When examined in conjunction with **Figure 1**, **Table 1** shows a trend slightly at odds to that seen in membership numbers. Whereas membership numbers fluctuated while ultimately declining, the number of clubs fluctuated while ultimately increasing from 51 to 53.

Examples of Trends Observed from Row Ontario Maps:

- Central Region saw an increase in youth participants in the 2015-2016 season (possibly the post-Pan-American Games participation pop), this cohort was retained over at least a four year period (through 2019).
- The West Central Region has the highest concentration and most stable participation rates.
- The Niagara Region consistently has the highest number of youth participants. This region saw an increase in adult participation in 2019.
- Throughout the North and North Central Region, female participation remains noticeably higher than male participation throughout the time frame analyzed.



Phase 2: Statistical Analysis

Second, we ran a series of statistical analyses on the data in order to quantitatively assess participation trends across the province in the given time period. These analyses involved examining variations in age, gender, and community context (measured by the region and degree of rurality of participant’s postal codes).

Figure 4. Mean Age of All Participants by Region

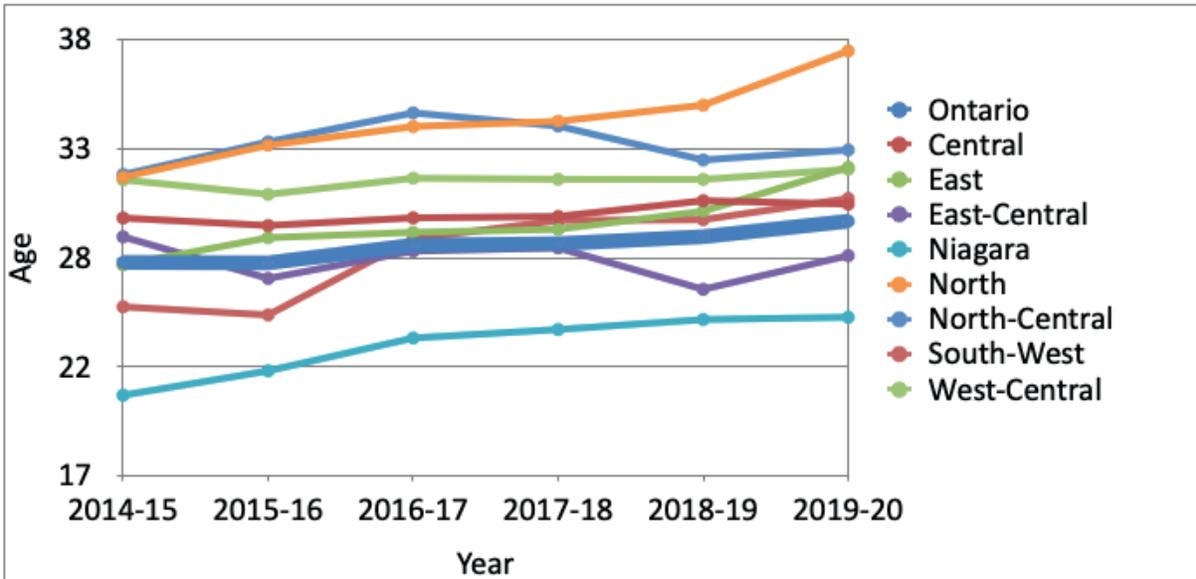
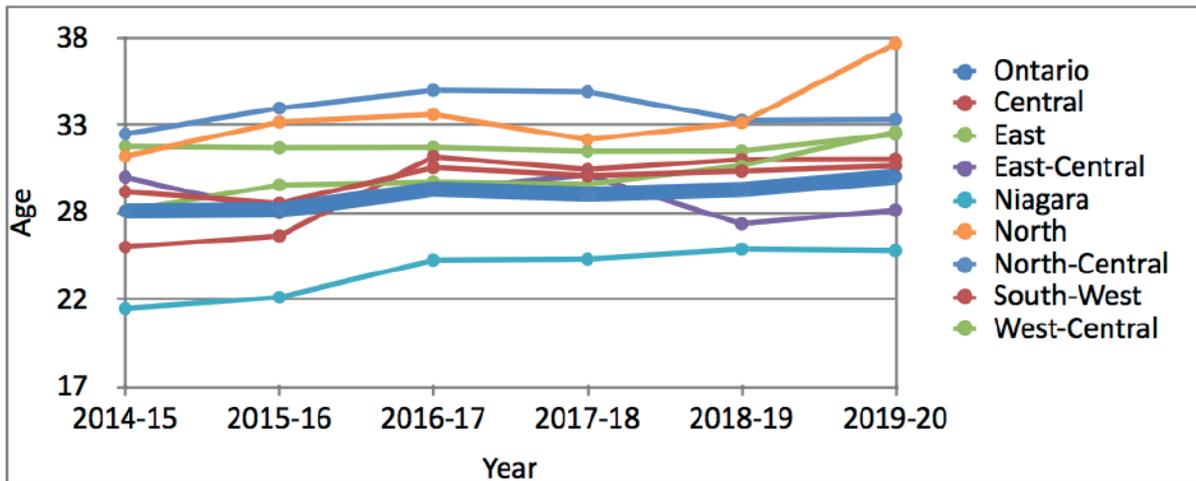


Figure 5. Mean Age of All Female Participants by Region



Analyzing participation data in this way allowed us to unpack and explore some of the trends identified above, in some cases quantifying the changes. The figures above illustrate the shifting age demographics of participants registered to the PSO. These trends, aligned with the broader participation trends identified above, and illustrate uneven changes in membership patterns across ages, demographics, and regions.

See appendices for a more detailed breakdown of participation numbers and mean ages by gender and region.

Trends Observed through Statistical Analysis:

- Overall, participation numbers have slightly decreased across the time period analyzed. However, the mean age of participants has increased from 27.3-29.3.
- The mean age of participants in each region varied widely from as low as 20.9 (Niagara 2014-15) to 37.5 (North 2019-20).
- Although the Niagara Region consistently has the youngest participants, the mean age has increased 3.7 years in this region over the time period analyzed.
- The East-Central Region was an anomaly. The mean age in that region decreased by 1.1 years over the time period analyzed.
- The proportion and mean age of female participants is higher than male participants across all regions.



Discussion & Implications

Spatial analysis of participation data from Row Ontario provided several interesting insights. Notably, the different regions identified by Row Ontario have very different groups of participants and indeed experienced different changes. Below, several trends are picked out and discussed.

Across the province, participation numbers appear to have decreased slightly across the time period analyzed. Simultaneously, the mean age of participants rose by two full years. While younger participants make up a large number of rowers in the organization, they are largely located in one region: Niagara.

Younger participants present a unique opportunity to increase (and subsequently retain) participants. It appears that (based on decreasing numbers and increasing mean age) clubs are more effective at retention in comparison to recruitment of new members. However, the numbers presented here may not tell the complete story. The Niagara Region has the greatest proportion of young rowers due to access to facilities and established participation pathways in local schools. However, this region - like most others - saw a marked increase in the mean age of participants despite a relatively stable number of participants. Varsity rowing teams, which play an important role in first contact and introduction to rowing in different regions, may play a particularly prominent role in the age-related trends. For example, the East-Central Region (which was the only region to see a decrease in the mean age of participants) is centered on Trent University which boasts a thriving rowing culture. The current analysis does not, however identify if and how rowers move across regions, for example in moving away to attend university.

With regards to gender, women make up a higher proportion of participants across all regions of the province. Further, the mean age of women participants in each region is higher than their male counterparts. The trend was most pronounced in the North and North-Central regions where female participation numbers is triple that of males. This indicates that both attraction and retention of women to the sport is more effective. Speculatively, these trends may be due to social norms and cultural differences in these regions which influence the relationship between gender and sport participation. These cases do provide interesting opportunities to explore the process that surround sport development in a sporting context that is working more effectively for women and girls (in terms of participation).



Future Research

The analysis conducted here provides a solid understanding of the geographic trends in the membership of Row Ontario. In particular it highlights the age and gender-related differences in the different regions of the province. Additionally, the data analyzed provides a foundation upon which a number of future analyses might take place. For example:

- Future analyses might compare the shifting demographic trends in membership to broader socio-demographic trends in the province. For example, this may include population changes and socio-economic trends within the regions (or CSDs).
- While age and gender related differences are prominent in different regions of the province, the conditions and mechanisms which produce these differences are unclear. Future work to understand the links between the regional contexts and the actions undertaken by clubs to recruit and retain participants is necessary to evaluate their effectiveness.
- While preliminary insights related to distances are provided, the data collected did not measure the frequency or rate of participation - only registration. In order to more fully understand the impacts of geography on participation, more detailed data on participation (e.g., frequency, intensity, level of competition, etc.) is necessary.
- Given that trends in the data were somewhat inconsistent across regions, a more longitudinal analysis would provide insights into the impacts of stand-alone events (e.g., Hosting the Pan American Games or the COVID-19 pandemic) and how they will impact participation trends in the long-term.



Appendices

The following tables represent the entire data set analyzed by region, and gender.

Total Participants by Region

	2014 -15	2015 -16	2016 -17	2017 -18	2018 -19	2019-20
Central	1482	1502	1440	1321	1558	1490
East	934	1100	1649	996	900	738
East-Central	328	471	442	331	357	274
Niagara	1388	1620	1816	1783	1892	1635
North	88	50	66	70	80	105
North-Central	160	199	172	167	192	175
South-West	427	407	425	320	314	301
West-Central	1327	1309	1157	1063	1153	1235

Total Female Participants by Region

	2014 -15	2015 -16	2016 -17	2017 -18	2018 -19	2019-20
Central	913	930	849	1321	930	861
East	556	673	1003	607	519	449
East-Central	198	267	249	199	190	174
Niagara	813	933	1093	1083	1147	1018
North	53	29	38	43	55	73
North-Central	120	142	125	123	141	129
South-West	247	221	242	182	178	186
West-Central	792	772	695	610	691	748

Total Male Participants by Region

	2014 -15	2015 -16	2016 -17	2017 -18	2018 -19	2019-20
Central	569	572	591	526	628	629
East	378	427	646	389	381	289
East-Central	130	204	193	132	167	100
Niagara	575	687	723	700	745	617
North	35	21	28	27	25	32
North-Central	40	57	47	44	51	46
South-West	180	186	183	138	136	115
West-Central	535	537	462	453	462	487

Mean Age All Participants by Region

	2014 -15	2015 -16	2016 -17	2017 -18	2018 -19	2019-20
Ontario	27.3	27.3	28.1	28.2	28.5	29.3
Central	29.4	29.1	29.4	29.5	30.2	30.1
East	27.2	28.5	28.7	28.9	29.7	31.9
East-Central	28.5	26.5	27.8	28.0	26.0	27.6
Niagara	20.9	22.1	23.6	24.0	24.5	24.6
North	31.4	32.9	33.8	34.1	34.9	37.5
North-Central	31.5	33.1	34.5	33.8	32.2	32.7
South-West	25.1	24.7	28.4	29.3	29.3	30.4
West-Central	31.3	30.6	31.3	31.3	31.3	31.8

Mean Age Female Participants by Region

	2014 -15	2015 -16	2016 -17	2017 -18	2018 -19	2019-20
Ontario	27.6	27.7	28.9	28.6	28.9	29.7
Central	28.8	28.1	30.2	29.7	30.0	30.3
East	27.6	29.2	29.4	29.2	30.3	32.4
East-Central	29.6	27.5	28.9	29.8	26.8	27.7
Niagara	21.7	22.4	24.6	24.7	25.3	25.2
North	30.9	33.0	33.4	31.9	32.9	37.7
North-Central	32.3	33.8	34.9	34.8	33.1	33.1
South-West	25.4	25.1	30.9	30.1	30.7	30.7
West-Central	31.5	31.4	31.4	31.2	31.2	32.2

Mean Age Male Participants by Region

	2014 -15	2015 -16	2016 -17	2017 -18	2018 -19	2019-20
Ontario	26.8	26.6	26.9	27.5	28.0	28.6
Central	30.5	30.7	28.3	29.1	30.6	29.8
East	26.5	27.3	27.7	28.3	28.9	31.0
East-Central	26.8	25.2	26.5	25.3	25.0	27.5
Niagara	19.7	21.6	22.1	23.0	23.3	23.7
North	32.1	32.9	34.4	37.5	39.1	36.9
North-Central	29.3	31.3	33.4	31.2	29.8	31.5
South-West	24.7	23.1	25.1	28.2	27.5	29.7
West-Central	30.9	29.3	31.2	31.4	31.3	31.1

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