



How many Referees are in Hockey Winnipeg and How Many Quit Each Year?

Each season Hockey Winnipeg publishes a late-October list of registered Referees to help minor hockey RICs know who is registered to Referee the coming season. The following research uses registration lists from 2016-2017, 2017-2018, 2018-2019 and 2019-2020 to answer several questions:

- 1) How many Referees are registered in Hockey Winnipeg? How many first-year Referees?
- 2) How do the number of Referees (or first-year Referees) change each season?
- 3) How many Referees leave each year?
- 4) How do different minor hockey associations compare in number of Referees? Attrition rate¹?
- 5) Can we predict, based on number of Referees in a minor hockey association, how many will quit?

To answer these questions, 3 comparisons using four seasons of data were made:

	Season A: Start Season	Season B: Comparison Season
Comparison 1	2016-2017	2017-2018
Comparison 2	2017-2018	2018-2019
Comparison 3	2018-2019	2019-2020

This means that the analysis would tell us how many Referees from 2016-2017 were still present in 2017-2018, how many from 2017-2018 were still present in 2018-2019 and how many in 2018-2019 were still present in 2019-2020.

Results

The results are broken into two parts: the number of Referees during each season and the percentage of Referees who quit from one season to the next.

Table 1 (top table on page 2) shows the number of Referees for each season broken down by minor hockey association as well as the total number of Referees in Winnipeg. Furthermore, the left side of this table shows the number of all Referees and the right side summarizes the number of first years.

For example, take a look at left side of the table and find the St. Vital row. St. Vital had 68 Referees at the end of October 2016-2017, 58 in October 2017-2018, and 54 in October of 2018-2019 for an average of 60 Referees at the end of an average October. Similarly, looking at the right side of the table, St. Vital had 21 first years in 2016-2017, 7 in 2017-2018 and 14 in 2018-2019. On average, St. Vital will have 14 new Referees each year.

Table 2 (bottom table on page 2) summarizes the attrition rate of Referees who leave from one year. Just as in Table 1, the date is separated into minor hockey associations as well as first years and everyone. For example, take a look at River East's row on the left side of the table.

¹ For this report, attrition refers to Referees leaving the job. $\text{Attrition\%} = \frac{\text{\#RefsLeft}}{\text{\#RefsPreviousYear}}$

River East had 28.95% of its 2016-2017 Referees quit by October 2017, 29.27% of Referees from 2017-2018 left by October 2018, and 13.33% from 2018-2019 left by October of 2019. Over these three years, on average, River East had an average attrition of 23.85%.

Similarly, the right side of Table 2 shows the percentage of first years that leave within 1 year of starting. For example, Assiniboine Park had 52.38% of first years from October 2016 leave by October 2017, 43.33% of first years from October 2017 left by October 2018 and 33.33% of those who started in October 2018 left by October 2019 for an average attrition of 43.02%

Table 1	All Referees including First Years				First Years Only			
	# Of Officials in October 2016	# Of Officials in October 2017	# Of Officials in October 2018	Overall Average # of Officials in October Each year	# Of First Years in October 2016	# Of First Years in October 2017	# Of First Years in October 2018	Overall Average # of First Years in October Of Each Year
Assn. Park	61	78	68	69	21	30	18	23
Fort Garry	43	50	45	46	19	15	13	16
Lord Selkirk	25	24	28	26	11	9	5	8
River East	38	41	45	41	11	14	11	12
St. Boniface	65	59	57	60	22	17	18	19
St. James	37	33	34	35	12	7	10	10
Seven Oaks	35	23	23	27	16	4	6	9
St. Vital	68	58	54	60	21	7	14	14
South Wpg	43	40	43	42	12	10	12	11
Transcona	26	23	21	23	5	3	6	5
Hockey Wpg	441	429	418	429	150	116	113	126
Avg/Area	44	43	42	43	15	12	11	13

Table 2	All Referees including First Years				First Years Only			
	% Left in October 2017	% Left in October 2018	% Left in October 2019	Overall Average % Left in October	First Year % Left in October 2017	First Year % Left in October 2018	First Year % Left in October 2019	% Average of First Years who left in October
Assn. Park	27.87%	44.87%	39.71%	37.48%	52.38%	43.33%	33.33%	43.02%
Fort Garry	25.58%	40.00%	13.33%	26.30%	21.05%	33.33%	15.38%	23.26%
Lord Selkirk	44.00%	20.83%	28.57%	31.13%	72.73%	11.11%	20.00%	34.61%
River East	28.95%	29.27%	13.33%	23.85%	36.36%	28.57%	0.00%	21.65%
St. Boniface	38.46%	40.68%	43.86%	41.00%	31.82%	41.18%	33.33%	35.44%
St. James	35.14%	39.39%	23.53%	32.69%	41.67%	42.86%	10.00%	31.51%
Seven Oaks	48.57%	47.83%	21.74%	39.38%	56.25%	25.00%	33.33%	38.19%
St. Vital	26.47%	41.38%	48.15%	38.67%	33.33%	42.86%	35.71%	37.30%
South Wpg	27.91%	30.00%	25.58%	27.83%	25.00%	10.00%	41.67%	25.56%
Transcona	34.62%	34.78%	33.33%	34.24%	60.00%	33.33%	33.33%	42.22%
Avg/Area	33.76%	36.90%	29.11%	33.26%	43.06%	31.16%	25.61%	33.28%

Discussion

There were 5 questions posed at the start of this report. Here are the answers:

- 1) How many Referees are registered in Hockey Winnipeg? How many first-year Referees?
 - Every season there were between 418 and 441 with an average of 429.
 - There is between 113 and 150 first years each season; average of 126.
- 2) How do the number of Referees (or first-year Referees) change each season?
 - There is less variation in total officials each year (a range of 23 with 2016-2017 having 441 and 2018-2019 with 418) than first years.
 - The number of first years varies more greatly with a high of 150 in 2016-2017 and a low of 113 in 2018-2019
- 3) How many Referees leave each year?
 - The attrition rate for all Referees (Attrition = 33.26%) and first years (33.28%) is very similar with both groups having an attrition rate around 33%.
- 4) How do different minor hockey associations compare in number of Referees? Attrition rate?
 - Looking at table 1, it is obvious that some areas have larger numbers² of Referees compared to others. A statistical analysis (called a Chi Square) showed the observations in Table 1 for all Referees or first year Referees to be significant. Therefore, this research suggests that the observed differences in number of Referees per minor hockey association is real and not due to chance or error. Therefore, some areas have more Referees than others.
 - Looking at Table 2, two areas have attrition rates for first years above 40% and only one area has an attrition rate above 40% for all Referees³. Similarly, only three areas have attrition rates below 30%⁴. What is the significance of these results? Using a statistical analysis (Chi Square) these results were determined to be insignificant. Therefore, there is no difference in attrition rates between different areas of the city.
- 5) Can we predict, based on number of Referees in a minor hockey association, how many will quit?
 - In the second point of #4 (what you just read), there was no significant difference between minor hockey association and attrition rate suggesting that attrition rate and area size alone cannot predict how many Referees will quit.
 - This was confirmed with a correlation analysis. There was no significant relationship between number of Referees and attrition rate.

Conclusions & Research Limitations

There are three main conclusions that can be drawn from this analysis of Hockey Winnipeg Referee registrations between October 2016 and October 2019:

² For example, Assiniboine Park, St. Boniface, and St. Vital average more than 60 Referees per year.

³ Assiniboine Park and Transcona have first year attrition rates above 40% with only St. Boniface having an attrition rate above 40% for all Referees.

⁴ Fort Garry, River East, and South Winnipeg have attrition rates below 30%.

1. The number of Referees in Hockey Winnipeg has stayed constant over the 4 seasons analyzed. However, there is a significant difference in the number of Referees in each minor hockey association.
2. The attrition rate for Hockey Winnipeg is about 33%. There is no significant difference between different minor hockey associations.
3. The number of Referees in a minor hockey association cannot predict the rate of Referee attrition.

There are three main limitations to this research:

1. While this research is aided by its large sample, it is limited to only answering questions about Winnipeg's Referees. The sample does not include Referees from all of Manitoba. To further understand referee attrition, and increase our understanding of why Referees quit, an analysis of Referees in all of Manitoba would be necessary.
2. Each Season's data was collected from late October due to the availability of the registrations lists. Therefore, this data may underestimate the total number of Referees to a minor degree. Future research could use the Hockey Canada Registry to acquire the complete registry form each season in question. However, the change in data is expected to have minimal effect as most Referees register by the end of October and the data set is large enough that more data will have minimal effect.
3. This research only assessed one factor that could effect Referee attrition, number of Referees in a minor hockey association. Other factors include other activities, reason for starting, age, and availability of mentorship. These factors should be explored in the future.