

ONTARIO SUPERIOR COURT OF JUSTICE

B E T W E E N:

**FAIR VOTING BC and
SPRINGTIDE COLLECTIVE FOR DEMOCRACY SOCIETY**

Applicants

- and -

ATTORNEY GENERAL OF CANADA

Respondent

AFFIDAVIT OF ANTONY HODGSON

TABLE OF CONTENTS

PART I: Personal Background	2
PART II: Fair Voting BC	3
(i) Educational work on electoral systems	4
(ii) Work on possible designs for federal and provincial electoral systems	22
(iii) Advocacy work in federal and provincial campaigns for electoral reform	23
(iv) Other work on broader democratic reforms	28
PART III: The “Parity in Legislative Power” Project	29
Genesis of the Project	29
(i) Saskatchewan Electoral Boundaries Reference:	29
(ii) ERRE Report:	32
Representation Metric: the percentage of voters represented by an MP for whom they voted	35
Legislative Power Share (LPS) Score: the share of legislative voting power held by individual voters relative to their ‘fair share’	40
Legislative Power Disparity Index: The distribution of legislative power amongst voters	50
Historical Party-Based Disparity Metrics	57

PART IV: The “Voter Participation and Strategic Voting” Project	60
PART V: The “Parity Across Time” Analysis Project	65
PART VI: Summary	71

AFFIDAVIT

I, Antony Hodgson, of the City of Vancouver, in the Province of British Columbia, AFFIRM
AS FOLLOWS:

1. I am the President of Fair Voting BC, which is one of the applicants in the present case. As such, I have personal knowledge of the matters deposed herein. Where I have relied on the information of others, I believe it to be true.

PART I: Personal Background

2. I am a Professor of Mechanical Engineering at the University of British Columbia, and hold degrees in Mechanical Engineering (BASc, UBC, 1984; MASc, UBC, 1986) and Medical Engineering and Medical Physics (PhD, Massachusetts Institute of Technology and Harvard University (jointly awarded), 1994).
3. I have been involved in the electoral reform movement since 2004, the year in which the BC’s Citizens’ Assembly on Electoral Reform was established (BCCA). My involvement stemmed from a desire to help the public better understand the recommendation of the BCCA that BC adopt the Single Transferable Voting (BC-STV) system, a form of **proportional representation (PR)** to replace our current form of voting, known formally as Single Member Plurality (SMP) and more colloquially as **First Past the Post (FPTP)**.

4. During the 2005 referendum campaign, I worked with David Robinson of DemoChoice USA to create an online simulator that allowed over 10,000 British Columbians to cast a realistic ballot using the proposed STV system.
5. In the referendum in May 2005, voters endorsed the BCCA's recommendation with a vote of 57.7% in favour. A majority of pro-reform votes was also obtained in 77 out of 79 districts in BC. However, the government opted not to implement the reform because they had passed legislation stating that they would only be bound by the results if a so-called "double majority" was achieved: 60% support overall and majority support in at least 60% of the ridings around BC.
6. Following the 2005 referendum campaign, I was invited to join Fair Voting BC as a board member.
7. In 2006, I made several submissions to the Ontario Citizens' Assembly on Electoral Reform, both individual and joint, which ultimately recommended by a vote of 94 to 8 that Ontario adopt a form of mixed member proportional representation (MMP). In the subsequent 2007 referendum, this proposal failed, with the reform proposal attracting only 36.8% support.
8. In 2009, I was elected president of Fair Voting BC and have continued to serve in that role until the present day.

PART II: Fair Voting BC

9. Fair Voting BC was founded in 1997 and is a non-partisan, registered, non-profit

society, which works for fair voting systems for Canadian elections and for all provincial, municipal, council, and independent organization elections in BC. Attached to this affidavit and marked as **Exhibit A** is a true copy of its Constitution.

10. Two of Fair Voting BC's objectives, as stated in its Constitution, are:

- (a) to serve as a catalyst for a programme of political and legislative reforms, with the objective of fostering a renewed political environment in the province; and
- (b) to educate interested members of the public about the democratic process and the responsibilities of citizenship.

11. Fair Voting BC's principal practical objective over the past 15+ years, since the BCCA issued its recommendation, has been to achieve voting reform that honours the spirit of and rationale behind the BCCA's recommendation.

12. As outlined below, Fair Voting BC has pursued this objective in three main ways:

- (i) educational work on electoral systems, (ii) work on possible designs for federal and provincial electoral systems, and (iii) advocacy work in federal and provincial campaigns for electoral reform. In addition, we have pursued (iv) other work on broader democratic reforms.

(i) Educational work on electoral systems

13. Fair Voting BC has undertaken extensive work to educate the Canadian public and politicians about the various existing electoral systems. For example, it has held discussion groups, participated in (and hosted) numerous events in various fora, and

made many presentations to the Canadian public and federal or provincial politicians. Attached to this affidavit and marked as **Exhibits B, C, D, and E** are copies of the following 3 presentations and one quiz, which introduce various electoral systems including the FPTP electoral system used in federal and provincial elections in Canada and the main forms of PR:

- “A Smartier Way to Vote”, which we posted on our website and which I presented in several community events during the 2009 referendum campaign;
- “Understanding Proportional Representation”, which is posted on our website as part of our general efforts to educate the public about proportional voting systems;
- “Understanding Proportional Representation -- Montreal Example”, which is posted on our website; this was intended to complement the more general presentation described immediately above by demonstrating how proportional voting would work in a part of Canada where five significant parties were competing for seats.
- “Fair Voting BC Electoral History Quiz”. This is a recently-updated version of a quiz we have used frequently as an ice-breaker in in-person events to debunk common myths about PR and FPTP.

14. As part of its education work, Fair Voting BC uses publicly available data to observe and document the implications on Parliamentary representation of Canada’s current FPTP voting system.

15. FPTP is a ‘winner-take-all’ system. Canadian voters are divided into 338 *electoral districts* (more colloquially referred to as *ridings*¹). Within each riding, the candidate who receives the most votes wins the seat and becomes an MP. The winning candidate does not have to win a majority of votes in his or her riding. He or she merely has to win more votes than any of the other candidates.

16. In a strong majority of ridings in the 2019 Canadian election (215 out of 338, or 63.6% of them), the winning candidate did not win a majority of votes.² Many won significantly less. In particular, two candidates were elected with less than 30% of the votes cast in their ridings:

- In Trois-Rivière, Louise Charbonneau (of the Bloc Québécois) won the riding with 28.5% of the vote, meaning that 71.5% of Trois-Rivière voters did not vote for the MP elected in their riding;
- In Sherbrooke, Élisabeth Brière (of the Liberal Party) won the riding with 29.3% of the vote, meaning that 70.7% of Sherbrooke voters did not vote for the MP elected in their riding.³

¹ I will use the terms *electoral district* and *riding* interchangeably in this affidavit. I will principally refer to *ridings* when discussing Canadian elections, and *electoral districts* when referring to non-Canadian elections. In non-Canadian contexts, an electoral district often contains multiple seats.

² https://en.wikipedia.org/wiki/Results_of_the_2019_Canadian_federal_election_by_riding.

³ It is possible to win a riding with a low percentage of the vote when several candidates are contesting the seat. In Quebec, where the Bloc Québécois contests seats along with the other major national parties, four-way contests are more frequent than in other provinces. E.g., Louise Charbonneau (28.5%) edged out the Liberal candidate (26.1%) and the Conservative candidate (25.2%), while the NDP candidate earned 16.7%. Similarly, Élisabeth Brière (29.3%) edged out the NDP candidate (28.3%) and the Bloc Québécois candidate (25.9%), while the Conservative candidate earned 10.7%. While such situations are most common in Quebec, three-way contests are common in most other provinces, and occasionally four-way contests arise, typically in places where either the Green Party or an independent does well; as an example of the latter, in the 2004 election in Saskatoon-Humboldt, Brad Trost (Conservative Party) won 26.7% of the vote, edging out NDP and Liberal Party challengers (25.6% and 25.5%, respectively), with an independent candidate (the former MP) earning 20.0% of the vote.

17. In addition, as illustrated in Figure 1 below, 18 candidates (5.3%) in the 2019 election won with less than 35% of the votes (including the two who won with less than 30%), 66 candidates (19.5%) won with less than 40% of the votes, and 139 candidates (41.1%) won with less than 45% of the votes.

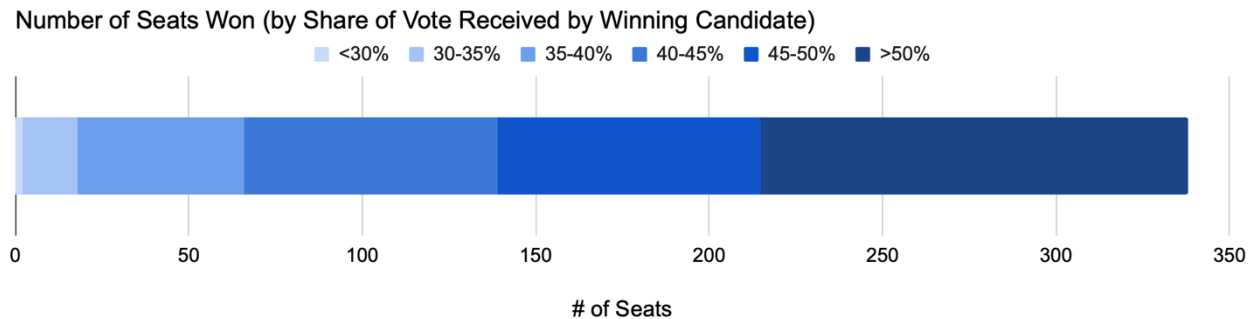


Figure 1. Number of seats won in the 2019 Canadian federal election by share of the vote received by the winning candidate. A majority of the seats (215 of 338, or 63.6%) were won with less than 50% of the vote (shown in the five lightest shades of blue).

18. It is useful to distinguish between votes cast for candidates who are elected and those that are not. We define a vote cast for an elected candidate as “effective”, as such a vote affects the composition of the legislature, and one cast for a candidate who is not elected as “ineffective”, as such votes do not have any effect on the composition of the legislature. Ineffective votes are commonly referred to as “wasted votes.”⁴ A voter’s likelihood of casting an effective vote depends on the relationship between a voter’s political preferences and those of their neighbours, and so varies considerably across the country. For example, a vote for a Green candidate in Calgary Centre is almost certainly going to be a wasted vote, as is a vote for a Conservative candidate in Laurier Sainte-Marie. The concept of wasted votes is useful for identifying which voters (characterized by political preference and region) are least likely to contribute to

⁴ https://en.wikipedia.org/wiki/Wasted_vote

electing an MP.

19. As a matter of democratic principle, essentially all votes should be effective and not wasted (in later sections we will show that alternative voting systems can come much closer to this ideal than Canada's voting system). Figure 2 illustrates how many votes cast in the 2019 Canadian federal election for candidates of various parties were effective in helping to elect an MP (i.e., they went to winning candidates; shown in darker shades) and how many were ineffective (i.e., they went to losing candidates, and had no effect on the makeup of Parliament; shown in lighter shades). Of the 17.9 million voters who cast votes in 2019, a majority of over 9.1 million (51.0%) cast wasted votes. There was a strong link between a voter's political preferences and the likelihood of casting a wasted vote, with supporters of some parties affected to a greater extent than others. Large majorities of voters who voted for the NDP, the Green Party, the People's Party of Canada, or for independent candidates in the last election cast a wasted vote: 82.9% of votes for NDP candidates were wasted votes (constituting 13.2% of all Canadian voters), 93.8% of votes for Green Party candidates were wasted votes (6.1% of all voters), 100% of votes for People's Party of Canada candidates were wasted votes (1.6% of all voters), and 88.0% percent of votes for other (including independent) candidates were wasted votes (0.7% of all voters). Votes for the main parties were also frequently wasted in this fashion. In fact, the single largest group of voters whose votes were wasted were the 2.48 million Conservative Party voters (i.e., 40.3% of the Conservative Party's voters and 13.9% of all voters). 37.0% of Liberal Party voters likewise saw their votes wasted (12.2% of all voters).

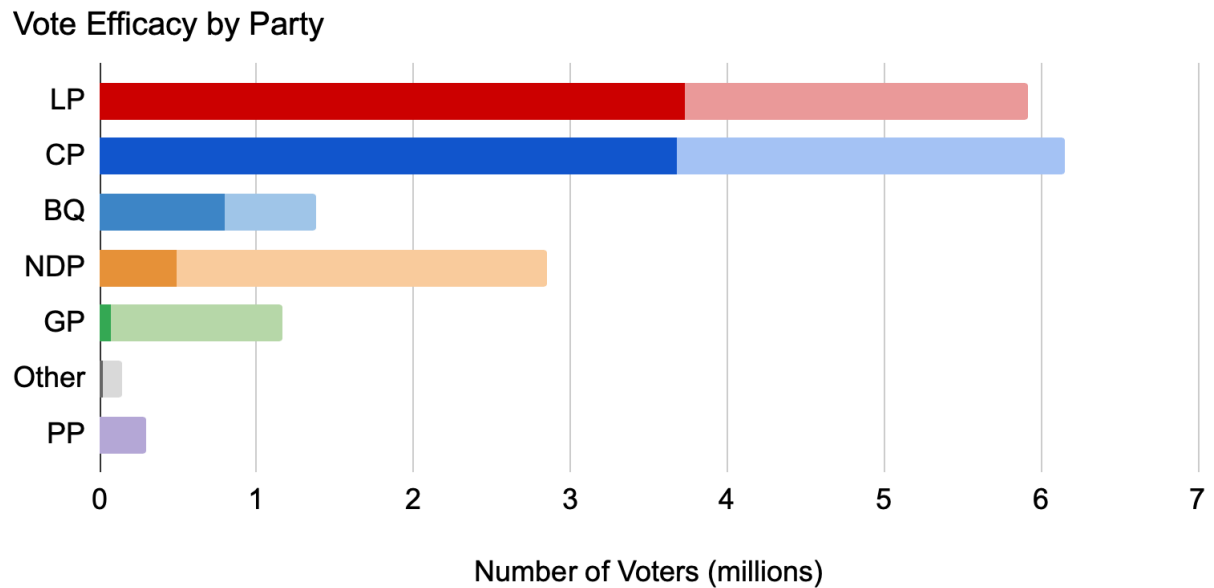


Figure 2. Representation of effective votes (solid shades) and ineffective, or wasted, votes (lighter shades) cast by party in the 2019 Canadian federal election. An effective vote is one cast for a winning candidate, while a wasted vote is one cast for a losing candidate.

20. Figure 3 below shows wasted votes in the 2019 federal election broken down by regions of the country. From this figure, we can see that voters who support the same party in different regions of the country experience significantly different voter effectiveness depending on where in the country they live. For example, in the Prairies, only 15% of Liberal Party and NDP voters were able to elect an MP they voted for, compared to 95% of Conservative Party voters. This means that the majority of Liberal votes in the Prairies (84.6%), and to a lesser extent BC (64%), were wasted. This ineffectiveness of the voting system in converting votes into seats has a significant impact on the ability of the Liberal government to craft a balanced cabinet: as of March 2021, only two out of the 37 cabinet ministers in the Liberal government were from the Prairies (both from Manitoba).⁵ Conversely, the majority of

⁵ <https://www.ourcommons.ca/members/en/ministries>.

Conservative votes in Ontario (57.3%) and the Atlantic (78.7%) were wasted, meaning that the Conservatives have limited representation from these regions in Parliament, despite their sizeable share of the vote in these regions (which comes close to the Liberal shares of the vote).

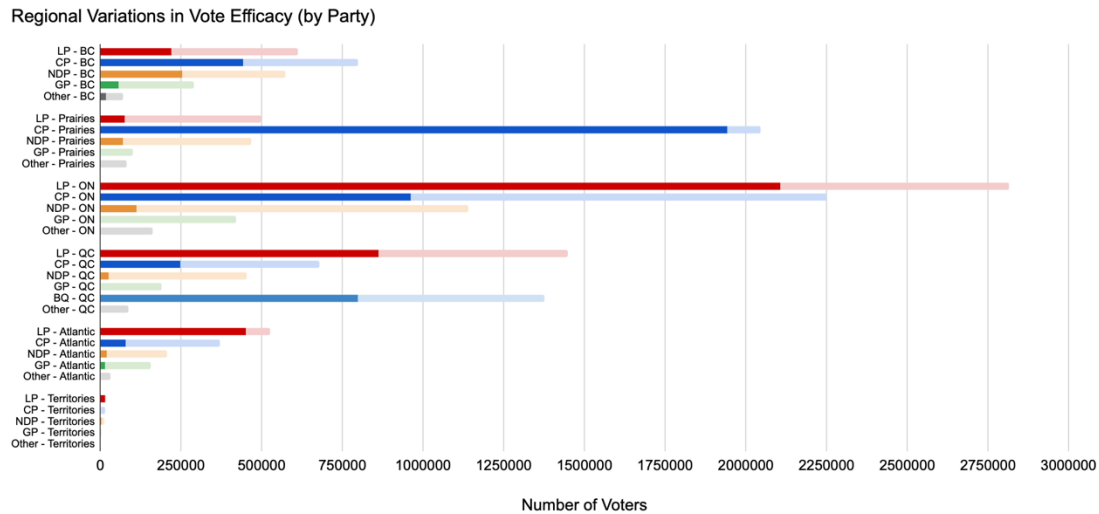


Figure 3. Regional variations in voter effectiveness by party for the 2019 Canadian federal election. Solid bars indicate votes cast for winning candidates; shaded bars indicate wasted votes. There are significant differences in the party distributions of voter effectiveness across the various regions of Canada, with supporters of each party typically having high voter effectiveness in one or more areas while being relatively excluded elsewhere.

21. Following an election, a government is formed, led by the party leader whom the Governor-General feels is best able to secure the confidence⁶ of the House of Commons. A government is called a ‘majority’ government if a majority of MPs belong to the same political party and is considered a ‘minority’ government otherwise. For example, in the 2015 federal election, the Liberal Party won 184 of the 338 seats in the House of Commons (54.4% of seats) and formed a majority government. In the 2019 federal election, the Liberal Party won a reduced number of

⁶ “Confidence” means that a majority of elected MPs agree to support the government in key votes in the House of Commons.

seats – 157 of 338 (46.5%) – and formed a minority government.

22. Regardless of whether a government is a majority or a minority, the MPs elected to the governing party are routinely elected by only a small minority of voters. For example, in the 2019 federal election, the 157 MPs belonging to the Liberal Party were elected by only 3.7 million of the 17.9 million voters who participated in that election (20.8%). Even in the 2015 election, which returned a majority government, the 184 MPs belonging to the Liberal Party were elected by only 4.6 million of the 17.7 million voters who participated in that election (26.2%).

23. In neither of these two recent elections was the leading party (i.e., the Liberal Party) supported by a majority of the voters. In 2019, Liberal Party candidates attracted only 33.1% of the votes, so it is perhaps not surprising that they ended up with a minority government, but even in 2015, when they won a majority government, Liberal Party candidates attracted only 39.5% of the vote – still well shy of a majority of popular support.

24. Such results are routine with our current voting system. In fact, as illustrated in Figure 4, the last so-called ‘true majority’ government in Canada (in which the winning party’s candidates received both a majority of seats *and* a majority of votes cast) occurred in the 1984 election in which the Progressive Conservative Party won an apparently overwhelming majority government, taking nearly three-quarters of the seats (211 of 282 seats) despite their candidates attracting only the barest majority of the votes cast (50.03%).⁷

⁷ Of these, 41.9% were effective votes, and 8.6% were wasted votes.

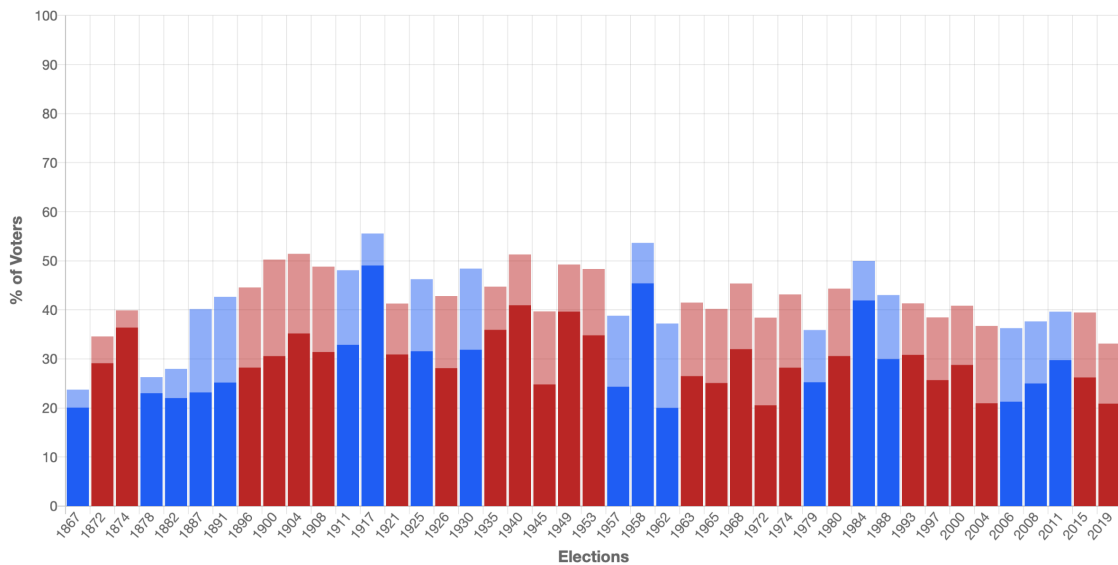


Figure 4. Percentage of effective votes (solid shades) and ‘wasted’ votes (lighter shades) cast for the party that won the greatest number of seats in each Canadian federal election.

25. As can also be seen in Figure 4, the winning party’s vote share (as received by all its candidates) has historically been going down. There have been 43 elections since Confederation. In the first 22 elections, there were four true majority governments (1900, 1904, 1917, 1940), along with several ‘near misses’ (47.4% in 1887, 48.6% in 1891, 48.9% in 1908, 48.6% in 1911, 47.8% in 1930, 49.2% in 1949, 48.4% in 1953). In the 21 elections since then, there have only been two true majority governments (1958 and 1984 – i.e., none have been elected in the nearly four decades since 1984), and in no election since 1984 has the leading party received more than 45.3% of the vote.

26. Furthermore, the trend has continued in the more recent elections. Since 1979, there

have been 13 elections, of which 8 have resulted in majority governments and 5 have resulted in minority governments (1979, 2004, 2006, 2008, and 2019). Across the 8 majority governments in this period, the winning party attracted vote shares ranging from 38.5% to 50.0%, averaging 44.7% in the first four elections resulting in a majority (1980, 1984, 1988, and 1993) and decreasing to an average of 39.6% in the last four resulting in a majority (1997, 2000, 2011, and 2015).⁸

27. Overall, the typical result of Canadian federal elections under FPTP in recent decades is that candidates from the party that wins the most seats win up to about 40% of the popular vote. Yet despite there having been only a single true majority government in the past 59 years (after the 1958 election) and despite having its MPs elected based on votes cast by little more than a quarter of the voters (typically cast in a limited portion of the country), the party winning the most seats nonetheless secures majority power in Parliament close to 70% of the time (~41 of the 59 years). This suggests that Canada has over the past few decades moved decisively away from the principle of “majority rule”.⁹

28. Because the winners of seats under a FPTP election are determined by the election of a single MP, riding by riding, the overall results of an election are highly sensitive to

⁸ Looking at the results more closely, we see from Figure 4 that the share of voters who cast effective votes and elected the majority of MPs, as shown by the dark-shaded bars, is much lower than the winning party’s overall vote share. Over Canada’s electoral history, the average percentage of effective votes cast for the party that won the most seats has averaged only 30.7%, and that this percentage has been decreasing over time. In the period from Confederation through to 1935, it averaged 33.1%, from 1940 through 1974 it decreased to 30.4%, and in the period since 1979, it has dropped yet further to 27.5%. Never in Canada’s electoral history has a majority of MPs been directly elected by a majority of the voters (the closest we have ever come is 49% in 1917). Details regarding the calculation of these statistics can be found in **Exhibit F**.

⁹ Defined in the Miriam Webster dictionary as “a political principle providing that a majority usually constituted by fifty percent plus one of an organized group will have the power to make decisions binding upon the whole”.

how voters and riding boundaries are distributed. As shown in Figure 5 below, 50 ridings (15% of all ridings) were decided by a margin of less than 5% in 2019 (indicated in red), and an additional 45 (13%) by a margin of under 10% (indicated in orange). These ridings are the most likely to change hands and are commonly referred to as ‘swing’ seats or seats ‘in play’. Conversely, 109 ridings (32% of all ridings) were decided by a margin of over 25% (indicated by the deeper green shades). These seats are considered to be relatively unlikely to change hands in a subsequent election and are commonly referred to as ‘safe’ seats.

Histogram of Margins in 2019 Federal Election

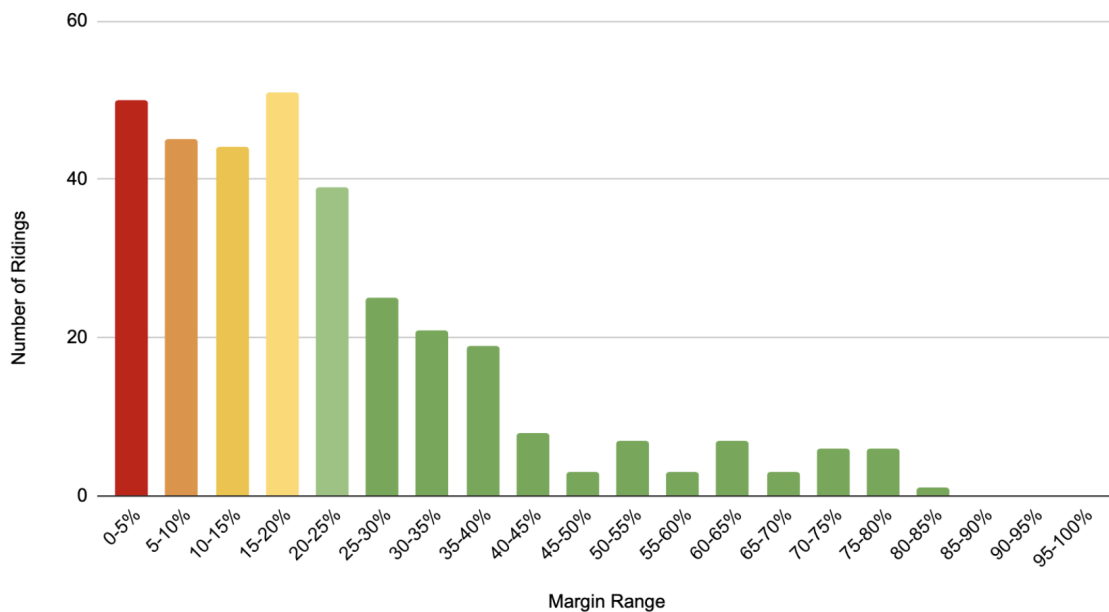


Figure 5. Histogram of margins in the 2019 federal election. Ridings where the margins are relatively low (<10%, shown in red and orange) are considered to be ‘swing’ seats, while ridings where the margins are relatively high (>20%, shown in green) are considered to be ‘safe’ seats.

29. The distribution of safe and swing seats varies across the country, affecting voters in different ways in different places. Figure 6, below, shows the proportion of seats in different regions based on the margin in each seat in the 2019 federal election. BC has the largest number of competitive (swing) seats, defined as a margin of under 10%,

while the Prairie provinces collectively have the largest proportion of safe seats (79% were decided by margins of >20%). Alberta and Saskatchewan each had only one seat decided by a margin of less than 10%. The other regions of the country (particularly Ontario, Quebec and Atlantic Canada) had an average of approximately 30% swing seats and 35% safe seats (margins >20%).

Proportion of Seats by Margin and Region (2019)

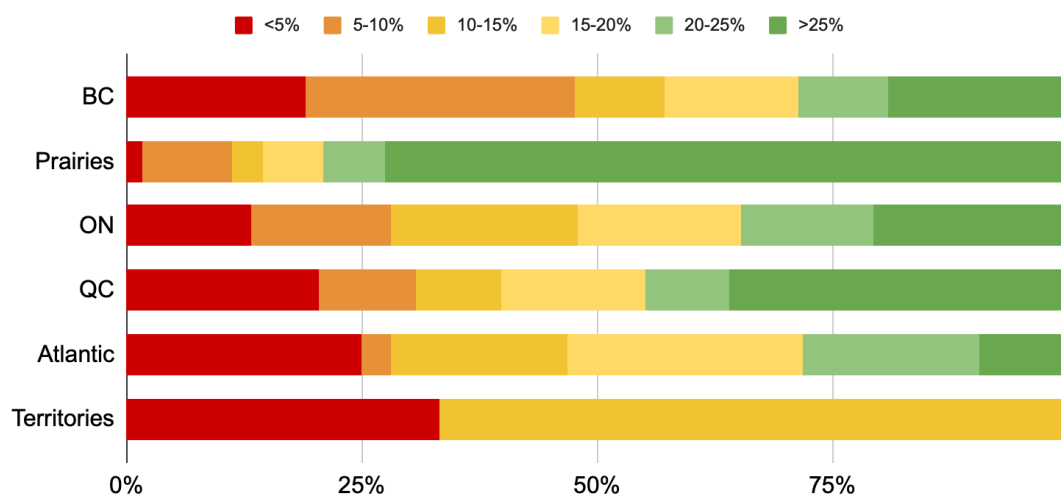


Figure 6. Regional distributions of seats by margin. The colour-coding corresponds to margin values shown in the previous figure. The Prairies have the largest proportion of safe seats (green), followed by Quebec, Ontario and BC. BC has the largest proportion of swing seats (48%, shown in red and orange), with the Territories, Quebec, Atlantic Canada and Ontario all having between 28% and 33% swing seats. The Prairie provinces have only 11% swing seats.

30. Because swing seats are decided by relatively few votes, small shifts in riding boundaries can alter the number of voters in a given riding and ‘swing’ the result to another party, even if there is no shift in the place of residence of voters or of their political preferences or even of the population of each riding. **Exhibit G** is a copy of a short presentation entitled “Gerrymander Wheel” prepared by STV Action (an electoral reform advocacy group in the UK) illustrating how seemingly innocuous shifts in riding boundaries can result in significantly different, indeed seemingly

arbitrary, electoral outcomes.¹⁰ Two snapshots from this presentation are included in Figure 7 below – in both cases, 120 voters are shown, divided into five ridings with slightly different electoral boundaries. 47 are Labour, 47 are Conservative, 22 are Liberal Democrats, and 4 are ‘other’. With the first set of boundaries (Position One), Labour wins four seats and the Conservatives win one (a highly inequitable outcome), while with the boundaries in Position Three, the Conservatives win three seats and Labour wins only 2. In other words, the “will of the voters”, as purportedly represented by the election results, can randomly vary depending on the riding boundaries in the election.

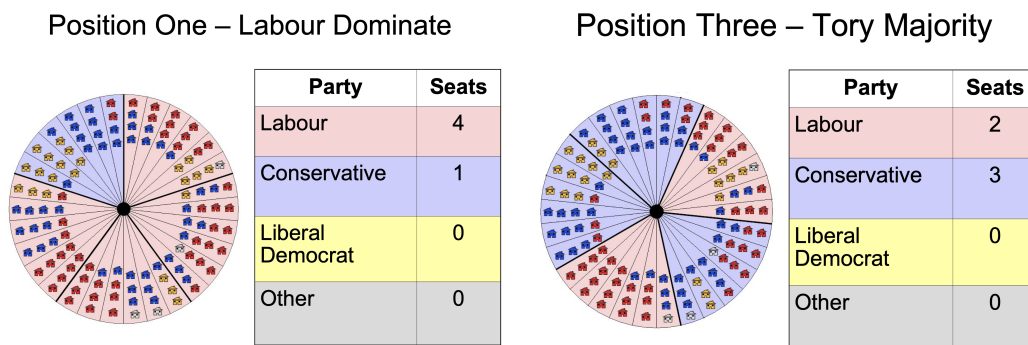


Figure 7. ‘Gerrymander Wheel’ from STV Action (UK). This wheel illustrates 120 voters (shown as houses), each colour-coded by their preferred political party (47 Labour, 47 Conservative, 22 Liberal Democrat and 4 ‘Other’), and divided into five electoral districts of 24 houses each. Depending on where the boundaries are drawn, very different numbers of MPs from the various parties are elected. In the two examples shown here, shifting the boundaries by two slots clockwise changes the outcome from 4 Labour MPs and 1 Conservative MP to only 2 Labour MPs and 3 Conservative MPs – a shift from Labour being up 3 relative to the Conservatives to down by 1, with no change in the underlying distribution or location of voters.

31. The combination of wasted votes, swing ridings, and variations in distribution of voters under FPTP generates disproportional aggregated results when considered by

¹⁰ Presentation available at https://stvact.files.wordpress.com/2013/08/gerrymander_wheel.pdf

party at the national level. For example, in the 2019 Canadian election:

- Conservative Party candidates received more votes than candidates of any other party – 34.3% – and 35.8% of the seats (121 seats) (this is reasonably proportionate);
- (but) only 33.1% of voters voted for candidates from the Liberal Party, which nonetheless won considerably more seats than the Conservative Party – 46.5% of them (157 seats) – which resulted in the Liberal Party forming a minority government despite their candidates receiving fewer votes overall than Conservative Party candidates;
- 16.0% of voters voted for candidates from the NDP, which won only 7.1% of the seats (24 seats);
- 7.6% of voters voted for candidates from the Bloc Québécois (less than half of the NDP voters), which won a disproportionately high 9.5% of the seats (32 seats, 33% more than the NDP, despite their candidates receiving less than half as many votes);
- 6.6% of voters voted for candidates from the Green Party, which won only 0.9% of the seats (3 seats);
- 1.7% of voters voted for candidates from the People's Party, which won 0 seats.¹¹

32. Similar disproportionalities occurred in the 2015 Canadian election:

¹¹ https://en.wikipedia.org/wiki/2019_Canadian_federal_election.

- 39.5% of voters voted for the Liberal Party, which won 54.4% of the seats (184 seats, which considerably exceeded the threshold of 170 seats required to form a majority government);
- 31.9% of voters voted for the Conservative Party, which won 29.2% of the seats (99 seats) – far fewer than the 157 seats the Liberal Party won in 2019 with only a fraction more of the popular vote (33.1%);
- 19.7% of voters voted for the NDP, which won only 13.0% of the seats (44 seats);
- 4.7% of voters voted for the Bloc Québécois, which won 3.0% of the seats (10 seats);
- 3.5% of voters voted for the Green Party, which won only 0.3% of the seats (1 seat).¹²

33. Fair Voting BC advocates for the adoption of and educates the public on **proportional representation (PR)**, which is the predominant voting system family among developed democracies today. It operates according to the basic principle that legislators are elected in proportion to how many voters vote for them. For example, in Canada, if 34.3% of voters vote for candidates from the Conservative Party (as they did in the 2019 election), then these voters should be able to elect Conservative Party MPs to roughly 34% of the seats; if 33.1% of voters vote for the Liberal Party, these voters should be able to elect Liberal MPs to roughly 33% of the seats; and if 16.0% of voters vote for the NDP, these voters should be able to elect NDP MPs to roughly 16%

¹² https://en.wikipedia.org/wiki/2015_Canadian_federal_election.

of the seats, etc.

34. PR systems use multi-member districts in whole or in part to elect their members.

These multi-member districts allow for the election of several candidates (from the same or different parties) to win seats in the same district, and ensures that most voters in these districts have an MP for whom they voted (in other words, a minimal number of votes are “wasted”).

35. Of note, while each of Canada’s 338 federal ridings currently elects only a single MP, this is a comparatively modern innovation in Westminster systems. At the time of confederation, the majority of ridings in the UK were multi-member ridings, and multi-member ridings there were not fully abolished until 1948. Several federal ridings in Canada have used multi-member districts in the past. The federal riding of Ottawa, for example, elected two members from 1872 to 1933. The federal riding of Halifax elected two members from the 1800s to 1966.¹³

36. The most commonly used PR system worldwide is called **List PR**. It is widely used in Western democracies, including in Norway, Sweden, Denmark, Finland, the Netherlands, Belgium, Spain, and Portugal. Under List PR, each party presents a list of candidates typically equal in length to the number of seats to fill in any given district.

¹³ Many provinces have also at various times used multi-member districts in the election of their legislative assembly members. Some of these have returned up to ten members. For example, the BC Legislative Assembly had a mix of single- and multi-member districts until the 1991 election; Manitoba and Alberta used the Single Transferable Voting system in multi-member districts in the larger cities prior to 1955 and 1956, respectively; Saskatchewan used a variety of multi-member districts until the 1960s; Ontario had dual-member districts until after the 1923 election; and all four Atlantic provinces have used multi-member districts at various times in their histories (until the 1970s in Newfoundland, Nova Scotia and New Brunswick, and until 1996 in Prince Edward Island), primarily for the purpose of ensuring balanced representation of the key religious groupings in their populations – namely, Catholics and Protestants (see “The Single Transferable Vote in Alberta and Manitoba”, Harold Jansen, PhD Dissertation, University of Alberta, 1998 for details).

Voters vote for the party list of their choice, and parties receive seats in proportion to their overall share of the vote in the district. In “closed” List PR systems, winning candidates are then selected from the party lists in order of their position on these lists. In “open” List PR systems, voters play a role in determining the winning candidates within each party list. Attached to this affidavit and marked as **Exhibit H** is a copy of the ballot format used in Norway’s elections (which uses an open list variant of List PR).¹⁴

37. In List PR, the number of members per district varies from country to country and can vary between regions within a country. For example, the Netherlands uses a single national district to elect the 150 members of its legislative assembly;¹⁵ and Norway has districts ranging from 4 to 19 members (where, as in Canada, rural districts are overrepresented compared to urban districts).¹⁶

38. Some List PR systems also provide for minimum vote thresholds before a party gains representation in the legislature (often 3% or 5%).

39. **Single Transferable Vote (STV)** is the second principal variant of PR, used in Ireland, Northern Ireland, Malta, and the Australian Senate, among other places. Under STV, legislators are elected from multi-member districts using ranked ballots. The vote on a ballot goes to the voter’s first preference if possible, but if the voter’s first

¹⁴ This image was obtained from the Norwegian election regulations posted at https://lovdata.no/dokument/SFE/forskrift/2003-01-02-5/KAPITTEL_8#§36.

¹⁵ https://aceproject.org/main/english/es/esy_nl.htm

¹⁶ <https://www.regjeringen.no/en/topics/elections-and-democracy/den-norske-valgordningen/the-norwegian-electoral-system/id456636>, <https://www.ssb.no/en/valg/statistikker/stortingsvalg>; by ‘over-represented in rural areas’, we mean that the ratio of the number of legislators to the number of voters is higher in rural areas than urban areas.

preference is eliminated, the ballot is then transferred to next-ranked preferences until the ballot is ultimately used to elect a winning candidate. Attached to this affidavit and marked as **Exhibit I** is a copy of the ballot used in County Wicklow in the 2002 Irish election (which used STV).¹⁷ The number of members per district can vary – Ireland, for example, has 3 to 5 members per district, while Northern Ireland has 6 members per district.

40. BC-STV, which was recommended by the BCCA in 2004, is a version of STV tailored for use in British Columbia. Its main design feature specified by the assembly was that the district magnitude should vary depending on its population density. District sizes of up to seven were to be used in the most heavily-populated parts of the province and sizes of down to two were to be used in the most sparsely-populated parts of the province.

41. A third kind of proportional voting system frequently discussed for potential use in Canada is the **Mixed Member Proportional (MMP)** system, used for example in New Zealand, Germany, Scotland, and Wales. MMP uses FPTP to elect a fraction of its legislators in single-member districts (typically 50-65%), with the remaining legislators elected using a List PR mechanism so as to achieve a correspondence at the party level between votes cast for candidates from the various parties (and/or party lists) and seats won by candidates from the parties. Although MMP is sometimes technically classified as a “hybrid” voting system (in that it combines features of FPTP and PR), it is widely treated as a proportional voting system in the academic literature

¹⁷ https://www.tcd.ie/Political_Science/people/michael_gallagher/STVBallotPaper.php

and by various advocacy groups around the world because it delivers a strong overall correspondence between vote share and seat share by party that is characteristic of proportional voting systems. Attached to this affidavit and marked as **Exhibit J** is a copy of a sample of the ballots used in New Zealand's elections (which uses a so-called *closed list* form of MMP).¹⁸

42. Each of these main variants of PR systems have a wide number of unique sub-variants that are designed to adapt to specific contexts while maintaining a strong overall correspondence between vote share and seat share.

43. Attached to this affidavit and marked as **Exhibit K** is a copy of the Electoral System Families tree, drawn from the International Institute for Democracy and Electoral Assistance (IDEA) Handbook on Electoral System Design¹⁹ illustrating a typical classification of electoral systems.

(ii) Work on possible designs for federal and provincial electoral systems

44. Fair Voting BC has also worked to design or develop variations on these standard voting systems intended for use in the Canadian context. In particular, Fair Voting BC worked with Fair Vote Canada during the consultations led by the 2016 Canadian House of Commons Special Committee on Electoral Reform (ERRE) to propose a customized-for-Canada model that ultimately came to be known as Rural-Urban

¹⁸ This particular sample is taken from a presentation prepared by Elections New Zealand for the Canadian House of Commons Special Committee on Electoral Reform: see <https://www.ourcommons.ca/Content/Committee/421/ERRE/Brief/BR8391757/br-external/2PedenR-e.pdf>.

¹⁹ "Electoral System Design: The New International IDEA Handbook", available for download at: <https://www.idea.int/publications/catalogue/electoral-system-design-new-international-idea-handbook>

Proportional Representation, which combined the multi-member ridings of List PR or STV with a smaller top-up (compensatory) tier similar to that used in Mixed Member Proportional systems. The intent of this model was to capture the most frequently praised features of both STV and MMP designs (e.g., the candidate-centredness and local regional focus of STV and the province-wide party-level proportionality of MMP) in a single electoral system design. A variant on the Rural-Urban model was one of the voting options chosen by the BC government to be put to the voters in the 2018 BC electoral reform referendum.

45. At the invitation of the ERRE, I also collaborated with Byron Weber Becker (Computer Science, University of Waterloo) to develop some other sub-variants of proportional representation systems that aimed to maximize proportionality while retaining the current number of 338 federal MPs and minimizing or avoiding any revisions of existing federal electoral boundaries. Attached to this affidavit and marked as **Exhibit L** is a copy of the joint submission made by Mr. Becker and myself titled “ERRE Modelling With Constraints” dated November 2016, in which we describe models of MMP, STV, and Rural-Urban Proportional Representation that met all the above constraints.

(iii) Advocacy work in federal and provincial campaigns for electoral reform

46. Consistent with its objective of implementing proportional voting systems in Canadian and BC elections, Fair Voting BC has actively participated in recent consultations and campaigns for electoral reform.

47. Various electoral jurisdictions in Canada have, over decades, conducted numerous studies on how to improve their electoral systems. Royal commissions, law commissions, parliamentary committees, citizen assemblies, political parties, political scientists, and election officers have almost universally pointed out significant problems with the current First-Past-the-Post voting system and made recommendations to their commissioning governments that proportional representation be adopted or considered for adoption.²⁰ For example, in 2004, the Law Commission of Canada released “*Voting Counts: Electoral Reform in Canada*”, which concluded that Canada's FPTP system no longer meets the aspirations of many Canadians, explaining that:

Canada inherited its first-past-the-post electoral system from Great Britain over 200 years ago, at a time when significant sections of the Canadian population, including women, Aboriginal people, and non-property owners, were disenfranchised.

Throughout the first half of the 19th century and for 50 years after Confederation, the strengths of our electoral system were evident: it fostered competition between two major parties and provided the successful party with a strong, albeit artificial, legislative majority. Territory, embodied in the direct link between the Member of Parliament and his (for they were all men) constituents, was the most important aspect of a citizen's political identity and the pre-eminent feature of prevailing notions of

²⁰ E.g., among others, the Manitoba Law Reform Commission in 1977, the Pépin-Robarts Commission (federal) in 1979, the Quebec Electoral Representation Commission in 1984, the PEI Electoral Reform Commission in 2003, the Béland Commission in Quebec in 2003, the Commission on Prince Edward Island's Electoral Future in 2004, the BC Citizens Assembly in 2004, the Law Commission of Canada report in 2004, the Commission on Legislative Democracy in New Brunswick in 2005, the Quebec Citizens' Committee in 2006, the Ontario Citizens' Assembly in 2007, the White Paper on Democratic Renewal in PEI in 2015, the House of Commons Special Committee on Electoral Reform (federal) in 2016, the Independent Commission on Electoral Reform in the Yukon in 2018, and the How We Vote consultation in BC in 2018, as well as a number of commissions and panels at the municipal level.

representation.

Canada's political, cultural, and economic reality has vastly changed; the current electoral system no longer responds to 21st century Canadian democratic values.

Many Canadians desire an electoral system that better reflects the society in which they live—one that includes a broader diversity of ideas and is more representative of Canadian society. For these reasons, the Commission recommends adding an element of proportionality to our electoral system.

Furthermore, because of its many potential benefits, electoral reform should be a priority item on the political agenda. Overall, the Report recognizes that no single measure will suffice to address the complex challenges facing Canadian democracy in the 21st century. However, it has become apparent that the first-past-the-post electoral system no longer meets the democratic aspirations of many Canadians. Electoral reform is thus a necessary step to energize and strengthen Canadian democracy.

48. Attached to this affidavit and marked as **Exhibit M** is a copy of the Law Commission of Canada's report.

49. Despite the many studies conducted over the decades, most of them by independent bodies or commissions, and despite referendum or plebiscite questions that have returned majority results in favour of change or voters having elected parties that promised to change the voting system,²¹ none of these processes have ultimately

²¹ E.g., the 2005 BC referendum in which 57.7% of voters supported adopting the Single Transferable Vote system and the 2016 Plebiscite on Democratic Renewal in Prince Edward Island in which 55.0% of voters supported adopting a Mixed Member Proportional voting system in the final round of the runoff vote held there. Prime Minister Trudeau famously reneged on his 2015 election promise that that election would be the last held under First Past the Post, and, most recently, Quebec's CAQ government, which had been elected in 2018 after having made an agreement with the Parti Québécois and Québec Solidaire to implement electoral reform directly, also reneged on its promise and now does not intend even to hold a referendum on reform prior to the next election (see

resulted in any change to the voting system at either the federal level or in any provincial jurisdiction.

50. In the 2005 electoral reform referendum, Fair Voting BC actively advocated for the BCCA's recommendation to adopt BC-STV. As noted above, voters endorsed this recommendation with a vote of 57.7% in support in the referendum, but the government opted not to implement the recommended reform because voter support did not meet the 60% threshold for binding the government that the government had imposed in the *Electoral Reform Referendum Act*, SBC 2004, c 47 (enacted on May 20, 2004 after the Assembly had been formed and was underway).
51. In 2009, the BC government held a second referendum on electoral reform. Fair Voting BC was designated by the government as the official proponent organization and given a budget of \$500,000 to advocate in support of the recommended change to STV. Ultimately, since only 39.1% of referendum voters supported the proposed change, the proposed change was not enacted.
52. During the 2015 federal election, the Liberal Party of Canada campaigned on the promise that it would be the last federal election under FPTP. The party's platform stated that a Liberal government would form an all-party Parliamentary committee, and introduce legislation enacting electoral reform within 18 months.
53. Following the Liberal victory, the government established the 2016 Canadian House of Commons Special Committee on Electoral Reform. Fair Voting BC provided

<https://www.theglobeandmail.com/opinion/article-power-loving-legault-exposes-his-true-colours-on-electoral-reform/>, April 30, 2021).

submissions to the ERRE in favour of the adoption of a PR system. Attached to this affidavit and marked as **Exhibits N and O** are copies of Fair Voting BC's written submissions to the ERRE titled "The Civil Rights Case for Voting Reform" and dated 27 September 2016 as well as my in-person testimony before the ERRE Committee as President of Fair Voting BC on 27 September 2016.

54. I also personally submitted to the ERRE a document titled "Reflections and Final Words of Advice" dated September 2016. Attached to this affidavit and marked as **Exhibit P** is a copy of this document.

55. On 28 November 2016,²² the ERRE presented its report to the House of Commons recommending Canada hold a referendum to adopt a proportional representation voting system for federal elections. On 1 February 2017,²³ the government announced that it was no longer pursuing electoral reform.

56. In 2018, BC held another referendum on electoral reform. Fair Voting BC provided submissions to the BC government's How We Vote public input and consultation process leading to the referendum. Attached to this affidavit and marked as **Exhibit Q** is a copy of a document titled "Fair Voting BC's Submission on BC's Electoral Reform Referendum" (February 2018) and provided to the BC government.

57. In the 2018 referendum, Fair Voting BC was a central partner in the Vote PR BC coalition that served as the official proponent arguing in favour of adopting PR. 38.7%

²² <https://www.ourcommons.ca/Committees/en/ERRE/Work?parl=42&session=1>

²³ <https://www.thestar.com/news/canada/2017/02/01/trudeau-drops-pledge-to-reform-canadas-electoral-system-in-his-first-term.html>

voted in favour of reform. This coalition was formally constituted as the Make Every Voter Count Society. Attached to this affidavit and marked as **Exhibit R** is a copy of a document titled “Make Every Voter Count – Submission to British Columbia’s Attorney General” (February 2018) and provided to the BC government, on which Fair Voting BC collaborated in writing.

58. Following the referendum, Fair Voting BC commissioned a survey to understand why voters either voted the way they did or chose not to vote. The survey revealed that the primary issue for those who chose not to vote was “not feeling informed enough” (48%). Voters also suggested that they would be much more comfortable switching to proportional representation in a scenario where the proposal was guided by an independent citizens’ panel rather than by politicians and that they might prefer PR to FPTP in this context. Attached to this affidavit and marked as **Exhibit S** is a copy of the survey results.

(iv) Other work on broader democratic reforms

59. Following the 2009 BC referendum, Fair Voting BC’s focus widened to include a range of democratic reform issues, including discussing and promoting models for participatory democracy, advocating for increased opportunities for meaningful involvement by citizens and NGOs in the policy development processes, studying the security of (and recommending against) internet voting, and supporting improvements in campaign financing and disclosure rules, committee structures, and legislative conventions. Fair Voting BC has also been involved in efforts aimed at reforming municipal voting systems in both Ontario and British Columbia.

PART III: The “Parity in Legislative Power” Project

Genesis of the Project

60. In 2019, Fair Voting BC began collaborating with Byron Weber Becker (mentioned above) on a “*Parity in Legislative Power*” project to analyze, quantify, and visualize existing distortions created by the Canadian electoral system in relation to the principle of “one person, one vote”, i.e., distortions in the “relative parity of voting power” of Canadian citizens.
61. We adopted a multidisciplinary approach toward this project. Key contributors included myself (on behalf of Fair Voting BC), Byron Weber Becker (MMath, Computer Science), Denis Falvey (MA, Mathematics) and Matt Risser (MA, Global Governance) were key contributors. Mr. Risser is a director of Springtide Collective for Democracy Society, our co-applicant in this Ontario Superior Court of Justice application.
62. Our project drew inspiration from two sources: (1) the *Reference re: Electoral Boundaries Commission Act*, [1991] 2 SCR 158 (Saskatchewan *Electoral Boundaries Reference*), and (2) the findings of the 2016 House of Commons Special Committee on Electoral Reform (ERRE)’s report titled “Strengthening Democracy in Canada: Principles, Process and Public Engagement for Electoral Reform”.

(i) Saskatchewan Electoral Boundaries Reference:

63. In the *Saskatchewan Electoral Boundaries Reference*, the Supreme Court of Canada

concluded (at p 183) that the first condition of effective representation is “relative parity of voting power.” The court argued that dilution of voting power is problematic because it reduces the legislative power of the citizen and access to and assistance from his or her representative. In their words:

“A system which dilutes one citizen’s vote unduly as compared with another citizen’s vote runs the risk of providing inadequate representation to the citizen whose vote is diluted. The legislative power of the citizen whose vote is diluted will be reduced, as may be access to and assistance from his or her representative. The result will be uneven and unfair representation.”

64. In that case, the Court accepted that, while electoral ridings should have a reasonably similar number of voters (i.e., relative parity of voting power), deviations of up to 25 percent in the number of voters registered in urban and rural constituencies in the province could be justified due to geographical constraints in drawing boundaries and to give minorities more representation within a constituency.²⁴

65. Ridings in recent federal elections have almost always remained within 25 percent of the mean riding population of each province (also known as the *electoral quota*, which is calculated by dividing the number of voters in a province by the number of ridings in that province). The chart below (Figure 8) shows the distribution of relative electoral district sizes for Canadian federal elections over time.²⁵ The light and dark

²⁴ In the Saskatchewan Court of Appeal decision (*Ref. re: Electoral Boundaries Commission Act (Sask.) ss. 14, 20*, 1991 CanLII 8030 (SK CA)), the Court also accepted that a deviation of up to 50% could be tolerated in “extraordinary or special circumstances”. This was not at issue before the Supreme Court.

²⁵ Note: Electoral Boundary Commissions normally base their riding boundary decisions (and estimates of deviation) on population rather than votes cast. Since we do not have easy access to riding populations over time, we have approximated relative riding size using the numbers of votes cast in each riding rather than population, which may result in some discrepancies compared with using population, but we believe these discrepancies will be minor

green portions of the stacked bars show the proportion of electoral districts that have numbers of votes cast lying within +/- 25 percent of the mean number of votes cast per electoral district for their respective provinces. Since the 1991 Supreme Court decision in the Saskatchewan *Electoral Boundaries Reference*, approximately 90 percent of all electoral districts have met this threshold.²⁶

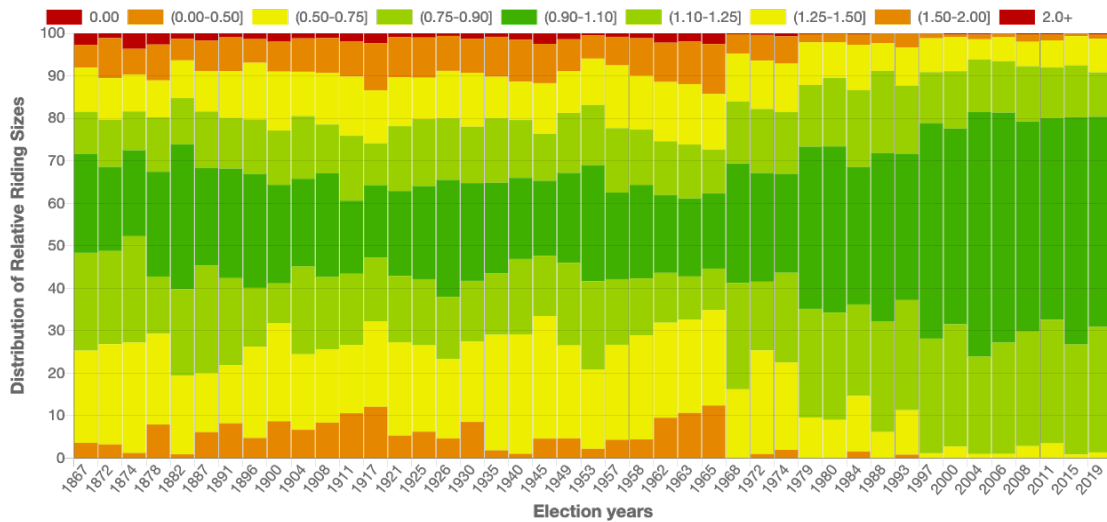


Figure 8. Distribution of relative electoral district sizes for Canadian federal elections over time. The relative electoral district size is defined here by the ratio of the number of voters in a given district to the average number of voters across all districts in a given province. The height of the different coloured bars in each stack above represents the percentage of districts in a given election with relative electoral district sizes in the corresponding range shown in the legend. For example, the dark green bar in the 2019 column indicates that approximately 50% of the districts in that election had a relative electoral district size lying in the range of 0.9 to 1.1.

66. As will be explained below, the *Parity in Legislative Power* project aims to extend the insight of previous court decisions that the right to democratic fairness requires that disparity with respect to participation should be limited (e.g., by imposing limits on

as we are not aware of any literature suggesting that there is a strong correlation between voting rates and riding populations.

²⁶ The significant discontinuity in 1968 between poorer and better parity coincides with when non-partisan Electoral Boundaries Commissions were introduced.

allowable deviations in riding populations) by developing similar measures of disparity to quantify, visualize, and demonstrate inequities related to the influence of voters on the outcomes of elections (i.e., who is elected and how our votes are translated into legislative representation and power).

(ii) ERRE Report:

67. The *Parity in Legislative Power* project also drew inspiration from the findings of the 2016 House of Commons Special Committee on Electoral Reform (ERRE)’s report titled “Strengthening Democracy in Canada: Principles, Process and Public Engagement for Electoral Reform” (the ERRE Report). The ERRE Report noted that the Gallagher Index was helpful to quantify disproportionality in the relationship between national vote share and seat share in Parliament (by party). Its primary recommendation was that the Government should seek to design a system that achieves a Gallagher score of 5 or less, in order to minimize the level of distortion between the popular will of the electorate and the resultant seat allocations in Parliament. A copy of the ERRE report is attached to this affidavit as **Exhibit T**.

68. The Gallagher Index is one of several similar indices frequently used in the political science literature to measure electoral system disparities between the total vote shares that political parties receive and their corresponding seat shares in Parliament (i.e., voter/party parity). In the Canadian context, it is used to quantify the degree to which the various parties (i.e., the Liberals, Conservatives, NDP, Greens, or others) received too many or too few seats relative to the number of votes that their candidates collectively received. The index may be computed at a number of levels: regionally,

provincially or nationally.

69. The Gallagher Index can be calculated for any electoral system in which candidates are affiliated with political parties. However, it only measures the disparity at the party level – i.e., whether a party receives a number of seats that is proportionate to the number of votes it and/or its candidates receives.²⁷

70. In contrast, our objective in the *Parity in Legislative Power* project was to measure the extent to which individual voters are or are not represented by an MP for which they voted. In other words, our analysis focuses specifically on treatment of voters rather than treatment of or impact on political parties.

71. In consequence, we formulated three simple indices to quantify and illustrate voter/representative parity under various electoral systems. Specifically, we devised:

1. The **Representation Metric (RM)**, which identifies the percentage of voters who are represented by an MP for whom they voted;
2. The **Legislative Power Share (LPS) Score**, which expresses the share of legislative voting power held by individual voters relative to a situation of parity; and
3. The **Legislative Power Disparity Index (LPDI)**, which summarizes the integrated impact and effect of disparities in legislative power that are felt and

²⁷ The Gallagher Index is also typically computed at the national level and ignores significant regional disparities, which are particularly important in a geographically-dispersed country such as Canada. For example, the Gallagher Index is indifferent as to whether votes received and seats awarded occur in the same regions of the country.

measured at the individual voter level by the LPS score.

72. We then applied these indexes both to Canada's historical elections (which use FPTP) and to recent elections in three selected countries using alternative (proportional) voting systems to illustrate typical differences to be expected between election outcomes in countries using FPTP and proportional voting systems: Norway (List PR), Ireland (STV), and New Zealand (MMP). The results show that:

1. FPTP is dramatically less effective than all three of the PR systems examined in ensuring that voters are represented by an MP for whom they voted.
2. FPTP provides no legislative power to citizens who do not vote for an elected MP while markedly exaggerating (roughly doubling) the legislative power of citizens who vote for an elected MP.
3. As a result, the FPTP system generates a significantly more uneven distribution of legislative power for individual voters than all three PR systems examined. FPTP is also much less effective than all three PR systems examined in preventing legislative power deviations of +/- 25 percent.
4. Voter/representative parity has been decreasing in Canada over the last century. In other words, under Canada's FPTP voting system, voters are increasingly represented by MPs for whom they did not vote; and a decreasing portion of voters hold an increasingly large share of legislative power.

Representation Metric: the percentage of voters represented by an MP for whom they voted

73. The first metric that we formulated draws on the foundational work of political theorist Hannah Pitkin, who argued that, for representatives to be considered “democratic”, voters must authorize them to act on their behalf. Since casting a vote for a candidate is the key mechanism by which a voter can express their willingness to be represented by a candidate, we defined the **Representation Metric** to be the percentage of voters who voted for an elected representative (i.e., an MP in Canada). If the votes of all voters counted towards electing an MP, the Representation Metric would be 100%. Conversely, the lower the fraction of voters whose votes count toward the election of an MP (or, put differently, the higher the fraction of “wasted votes”), the lower the Representation Metric will be. As explained below, Canada’s Representation Metric is dramatically lower than the Representation Metric in PR countries. This results from the fact that FPTP is less effective than List PR, MMP, and STV in ensuring that voters are represented by an MP for whom they voted.
74. The chart below (Figure 9) shows the Representation Metric for every federal election in Canada since Confederation. The heights of the green bars indicate the proportion of voters who cast a vote for the MP elected in their riding, while the heights of the grey bars indicate the proportion of voters who voted for a candidate other than the one elected in their riding. The Representation Metric has steadily decreased over time, from an average of 56.4% prior to 1935 to an average of 50.4% since 1935 (likely as a result of the emergence of electoral competition in the form of additional parties starting in the early-to-mid 20th century), and further to an average of only 49.8%

since 1984 (the first post-Charter election). Theoretically, a voting system that enables all voters to elect a representative for whom they have voted would have a Representation Metric of 100%.

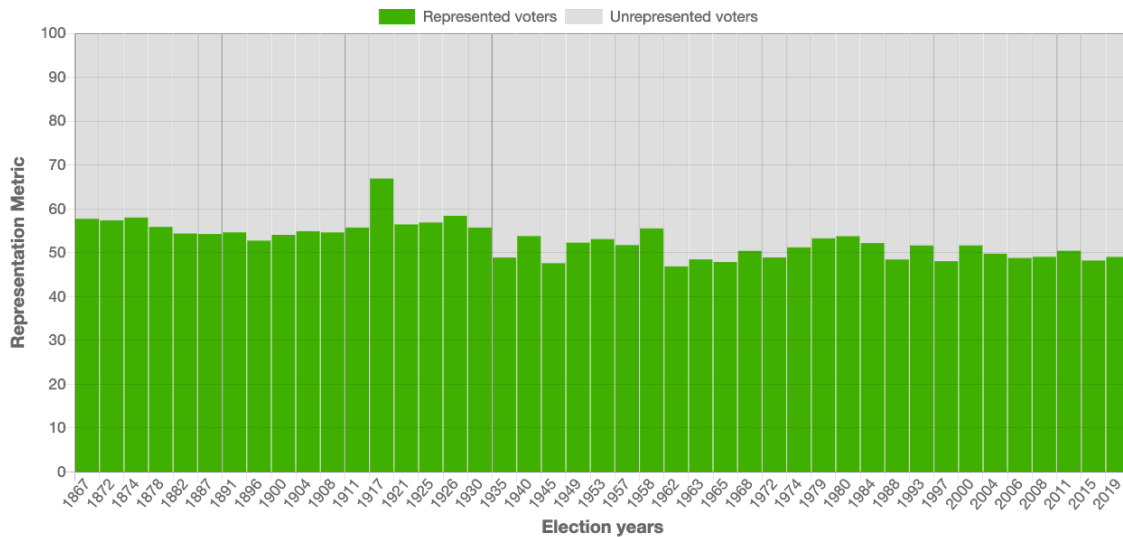


Figure 9. Representation Metric for all federal elections in Canada since Confederation. The Representation Metric expresses the percentage of voters who have voted for an elected MP. Since 1984, the Representation Metric has averaged 49.8%.

75. This pattern also holds generally in all regions of the country, as shown by the plot below (Figure 10) of the Representation Metric calculated for different regions of the country for all elections since Confederation, overlaid on the same bar chart as above for Canada as a whole. While there is some variation from region to region, the majority of regional variations are limited to +/- 10% from the mean.

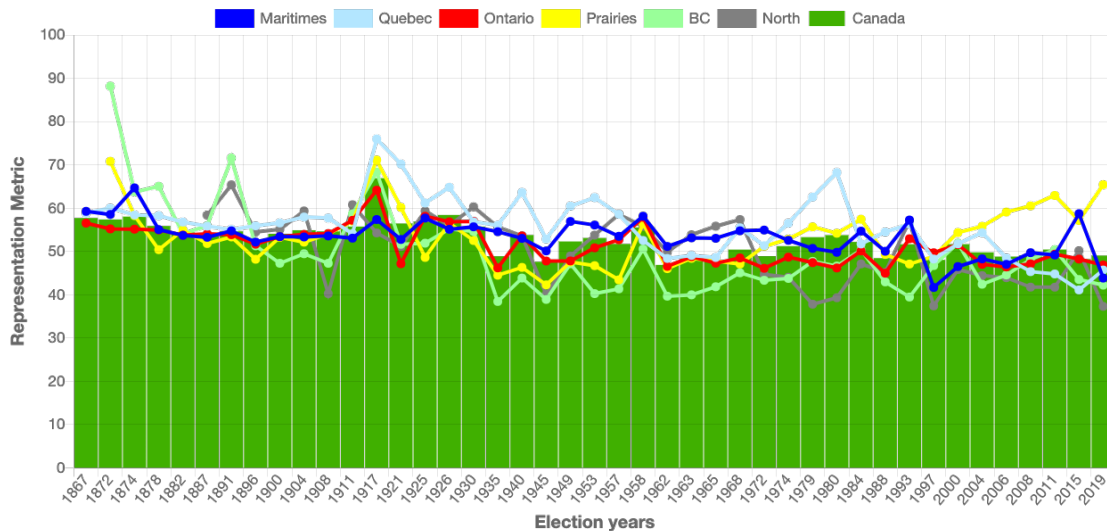


Figure 10. Representation Metric for all federal elections in Canada since Confederation, overlaid with the Representation Metrics in different regions of the country.

76. In PR voting systems, the Representation Metric is typically much higher (and the “wasted votes” much lower), because far higher proportions of the ballots cast affect the resulting makeup of the legislature. To demonstrate this point, we analyzed the results of the two most recent elections in the three countries mentioned earlier (Norway (List PR), New Zealand (MMP), and Ireland (STV)) selected as exemplars of the three main types of proportional voting systems.²⁸ The next paragraphs briefly describe how we calculated the Representation Metric for each of these elections (shown in Figure 11).

- Under **List PR**, candidates for each party are placed on a list. Voters in each riding (electoral district) vote either for the list or a candidate named on the list, and MPs in each riding are selected from the list in proportion to how many votes

²⁸ We analyzed the most recent elections in Ireland (STV, 2016 and 2020), New Zealand (MMP, 2017 and 2020) and Norway (List PR, 2013 and 2017). We selected these countries in part because detailed electoral district-level results were readily available in English, and (for the first two) the systems are used in Westminster Parliamentary democracies, which are particularly relevant to Canada.

the list (or the names on the list) received in the riding. For those voters who are not successful in directly helping elect an MP from the list, many List PR systems assign compensatory (or ‘levelling’) seats to ensure nationwide proportionality of results and further reduce wasted votes. Voters therefore can be said to indirectly elect these MPs as their votes contribute to the election of some MPs even if the voter does not explicitly name them on their ballot. In our example, Norway uses a modified List PR system in which 150 of the 169 parliamentarians are elected from 19 regional lists (one list per county, with varying number of parliamentarians, ranging from 4 to 18, elected per county), with the remaining 19 seats assigned as compensatory seats to ensure nationwide proportionality of results. In Norway’s 2017 election, we calculated that 84.7% of voters voted for a party that elected at least one representative in the voter’s electoral district.²⁹ We consider these representatives to be directly elected. The remaining voters voted for a list that received too few votes to elect a candidate in that electoral district. However, some of these voters voted for parties who were allocated one or more of the compensatory representatives elected to the levelling seats. We consider these representatives to be indirectly elected. In total, 93.5% of voters helped elect a candidate either locally or as a compensatory candidate (94.5% in 2013).

- Under **MMP**, voters vote for a candidate in their riding and for a party. Voters who vote for the winning local candidate are said to directly elect this MP. But under MMP, voters who vote for a losing candidate in their riding (and whose

²⁹ In Norway’s electoral system, voters are permitted to either vote directly for a candidate named on a party’s list or for the party list as a whole. If either choice leads to one or more candidates from that party’s list being elected in the local electoral district, we consider that to result in ‘direct’ representation.

votes would be wasted under FPTP) also see their party votes counted in the election of the compensatory MPs from the lists in order to ensure proportionality of overall results. In New Zealand's 2020 election, for example, 51.2% of voters voted directly for an elected district MP (similar to Canada) but, when compensatory list seats were added, 89.5% of voters had voted either directly or indirectly for an elected MP (94.9% in 2017). The remaining voters had voted neither for the MP elected in their district, nor for a party or person who won a compensatory list seat (typically these are voters who support small parties that do not win sufficient votes to be entitled to a list seat).

- Under **STV**, voters in each riding cast ballots on which they have rank-ordered candidates in order of preference. Candidates who do not receive a sufficient number of votes are eliminated, and the ballots cast for these eliminated candidates are transferred to the next lower choice identified on each ballot. This process is repeated until there are only as many candidates left as seats available. In Ireland's 2020 election, 78.9% of the ballots cast ended up counting for elected MPs in the final round of counting (77.4% in 2016).³⁰ The majority of the remaining voters had voted for the last candidate eliminated in the counting

³⁰ STV differs from other proportional voting systems in that voters rank their most-preferred candidates in numerical order. If a voter's top choice has insufficient support to be elected, the ballot is transferred to the next choice listed, so all voters who help elect a candidate will have directly named that candidate on their ballots – there is no indirect voting mechanism with STV as there is with List PR or MMP. Voters are free to rank candidates both within and across parties, and typically a party will run multiple candidates in each electoral district, so voters normally have the option to transfer their ballot to another candidate from their preferred party if their top choice is eliminated. One might argue that we are perhaps overestimating the Representation Metric for STV by counting lower preferences. However, in our calculations for the 2016 Irish election, we verified that the Representation Metric based on the party affiliations of the first-ranked candidates on each ballot was 76.4%, which is very close to the 77.4% number we calculated based on all preferences, so we conclude that this definition of Representation Metric fairly represents the results of STV elections.

process (a small fraction had voted only for candidates who had been eliminated earlier; these so-called ‘exhausted’ ballots were not counted in the final round).

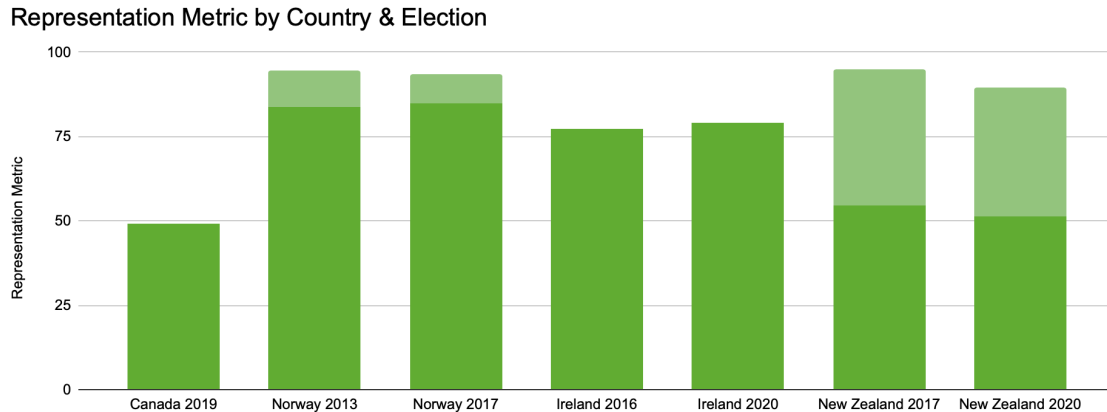


Figure 11. Representation Metrics for Canada (2019 federal election) and two recent elections in each of three selected countries using proportional voting (to demonstrate consistency of findings). The solid colours represent those voters who are represented by a representative for whom they have explicitly voted (‘direct’ representation), while the shaded colours represent those voters who are represented by a representative who won a seat by virtue of votes cast for the representative’s party (‘indirect’ representation). Norway uses a List PR system with 19 compensatory seats out of 169 seats total, Ireland uses a Single Transferable Voting System, and New Zealand uses a Mixed Member Proportional system. The two systems that use multi-member regions (Norway and Ireland) have similarly high levels of direct representation, while New Zealand has a level of direct representation similar to that of Canada due to its use of single member districts. The two systems that have a national compensatory element (Norway and New Zealand) have similarly high levels of total representation.

Legislative Power Share (LPS) Score: *the share of legislative voting power held by individual voters relative to their ‘fair share’*

77. As noted above, the Supreme Court of Canada concluded in the Saskatchewan

Electoral Boundaries Reference (at p 183) that the **legislative power** of the citizen whose vote is diluted will be reduced, resulting in “uneven and unfair representation”.

The *Parity in Legislative Power* project aims to extend this insight through the claim that legislative power depends not only on vote dilution, as the Supreme Court has noted, **but also on whether a voter is represented by an MP for which he or she voted**. In other words, voters who have an MP for whom they voted in Parliament (i.e.,

an MP who is aligned with their legislative interests and who relied on their vote) have legislative power; whereas voters who voted for a losing candidate (and whose MP is not aligned with their legislative interests and did not rely on their vote) have no legislative power. Ultimately, just as our electoral system strives for relative parity of voting power, it should also strive for relative parity of legislative power.

78. The second index that we formulated, the “Legislative Power Share” (LPS) score, measures the share of legislative voting power that individual voters hold compared to other voters in Canada. As we discuss below, the distribution of LPS scores across voters ultimately shows that Canada’s FPTP system dilutes the legislative power of citizens who do not vote for an elected MP while enhancing the legislative power of citizens who vote for an elected MP. Our LPS score is a voter-focused variation of a party-based metric defined in 2015 by the political scientists Kedar, Harsgor and Sheinerman in a paper entitled “Are Voters Equal under Proportional Representation?”, which they called the Conversion Ratio of Votes to Seats. A copy of this paper is attached to this affidavit as **Exhibit U**.

79. Each of Canada’s 338 MPs holds an equal share of legislative power in the Canadian Parliament. If a voter did not vote for their elected MP, this voter had no influence on the ability of the MP to exercise legislative power (and their MP did not rely on their vote). We therefore assign this voter a Legislative Power Share score of zero.

80. On the other hand, if a voter voted for their elected MP, the voter’s share of the MP’s legislative power depends on how many other voters in the riding also voted for the MP. In ridings where few voters voted for their elected MP, these voters each hold a

larger share of that MP's legislative power than in ridings where many voters voted for their MP, since we regard an MP's legislative power to be shared equally among all those voters who voted for them.

81. To determine the legislative power share of a voter who voted for their MP, we divide the average number of votes cast per seat in that voter's riding by the number of votes received by the elected MP. We then apply a weighting factor to adjust the share of each voter's legislative power depending on whether the total number of voters in the riding was greater or smaller than in other ridings (since voters in ridings with fewer voters have more impact on the election of an MP than voters in ridings with more voters). The mathematical and technical details underlying our Legislative Power Share score calculations are posted on <http://election-modelling.ca> and attached to this affidavit as **Exhibit V**.

82. Ideally, if each voter had equal influence on the makeup of the legislature, then every voter would have a Legislative Power Share score of 1. If a voter's Legislative Power Share score is greater than 1, that voter effectively has their voice in Parliament amplified relative to the average voter. Conversely, if a voter has a Legislative Power Share score of less than 1, then that voter has a diminished or diluted voice in Parliament. The relative representation of different voters becomes more uneven and unfair the more the distribution of LPS scores deviates from a uniform value of 1.

83. As an example of how we can compute the Legislative Power Share score for a specific riding within our current voting system, consider the results in my riding of Vancouver-Quadra in the 2019 federal election. My MP, Joyce Murray, won the riding

with 43.5% of the vote (22,093 votes out of 50,754 votes cast). This means that the relative local influence of the voters who supported Ms. Murray is $50,754 / 22,093 = 2.30$, which indicates that these voters have 230% as much influence in Parliament as they would if all voters in the riding had contributed equally to electing an MP. The total number of votes cast across all 42 BC ridings was 2,387,429, so the average number of votes cast per riding was $2,387,429 / 42 = 56,844$. Since Vancouver-Quadra has a smaller number of voters than the average across BC, the riding as a whole has a slightly larger influence than the average riding in BC, by a factor of $56,844 / 50,754 = 1.12$. Multiplying these two factors together means that a voter who cast a vote for Ms. Murray would have a Legislative Power Share score of $2.30 \times 1.12 = 2.57$, or over two and a half times what a 'fair share' amount would be. The remaining 28,661 voters in Vancouver-Quadra would have an LPS score of zero, as their votes did not contribute to electing any representative in Parliament.

84. We computed the Legislative Power Share scores in a similar manner for all voters in all ridings across Canada for each election since Confederation. An example of the results of the calculation for the 2019 federal election is shown below (Figure 12). This indicates that 51.0% of voters had a Legislative Power Share score of zero, and 41.7% of voters had an LPS score of 1.5 or greater. Only 7.3% of voters had an LPS score within +/-50% of parity.

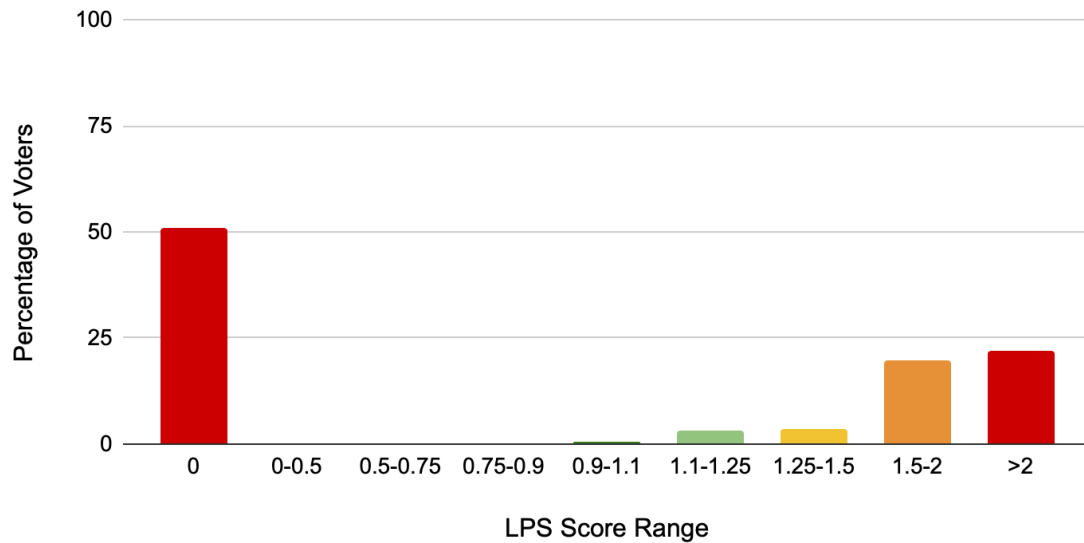


Figure 12. Histogram of Legislative Power Share scores in the 2019 Canadian federal election. Scores closer to the parity value of 1 are shown in green, while scores further away are shown in shades of yellow and red. The sum of all bars in the histogram is 100%.

85. To portray the Legislative Power Share score distributions over time, we used the same kind of figure presented earlier to portray the distributions of riding sizes by stacking the elements from the kind of histogram shown above for each election and portraying them side-by-side in Figure 13 below. Within each stacked bar, the height associated with each colour represents the fraction of Canadian voters who have a Legislative Power Share in the range shown in the legend (again, scores closer to the parity value of 1 are shown as green and scores further away in both directions (i.e., towards either under- or over-representation) are shown in yellow, orange and red). The values shown in the histogram above can be seen stacked in the rightmost bar in the chart below.

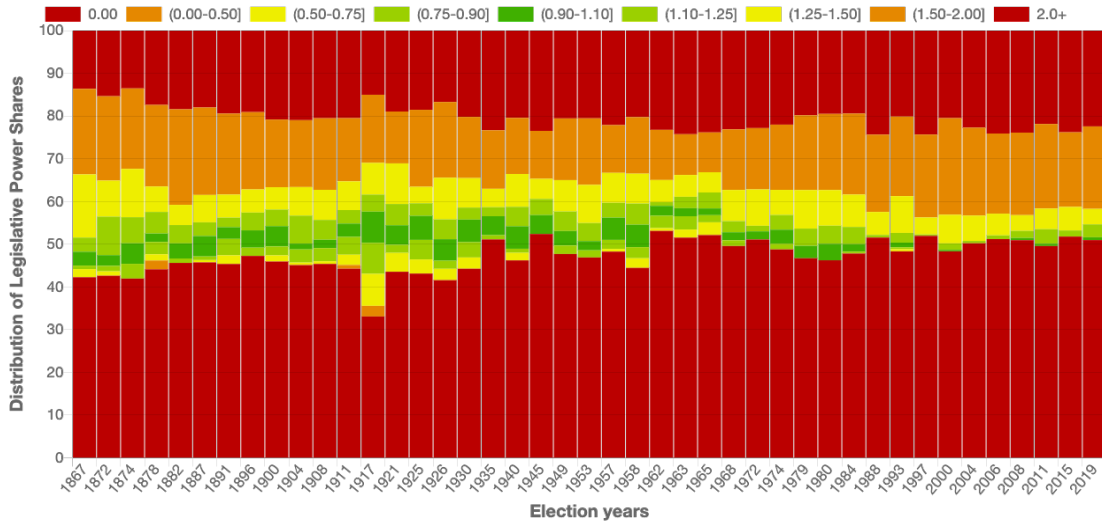


Figure 13. Stacked histograms of the Legislative Power Share scores in all Canadian federal elections since Confederation. Within each column, the height of a coloured segment shows the percentage of voters with an LPS score in the corresponding range shown in the figure’s legend (green indicates scores close to parity, red indicates scores furthest from parity).

86. As can be observed from the figure, voters with a Legislative Power Share score of zero have increased somewhat over time – from 43.5% prior to 1935 to an average of 50.1% in the past 60 years. This has largely come at the expense of the percentages of voters with a legislative power share within 25% of the mean (dark and light green bars), which have decreased from about 12.1% prior to 1935 to an average of 4.0% over the past 60 years, and only 2.4% since 2004. When contrasted against the chart shown in Figure 8, it becomes obvious that, while Canadian voters have substantial parity in riding size (mostly within +/-25% of the mean), Canadian voters do not have parity of legislative power. Furthermore, while parity of voting power (as measured by parity in riding sizes) has improved over time for Canadian voters, parity of legislative power (as measured by parity in LPS scores) has been decreasing.

87. In PR voting systems, because most voters vote for an elected MP (and do not see their votes “wasted”, as described above), their Legislative Power Share scores are expected to be much closer to 1. In other words, most voters will have in the legislature an MP

that they personally helped elect (and, conversely, their MP will have relied on their vote). The following paragraphs describe how we have calculated the Legislative Power Share under each of the comparator voting systems:³¹

- **List PR (Norway):** We consider a voter to receive a share of legislative power if they either:

1. Voted for a party that elected one or more representatives from the voter's regional list, or
2. Voted for a party that received a compensatory seat.

For a voter in the first situation, we assign them a Legislative Power Share score that represents the inverse of the average votes/seat won by their party locally by the average votes/seat cast nationwide. For example, in the 2017 Norwegian election, there were 2.93 million votes cast and 169 representatives elected, for an average of 17,319 votes per seat. For example, in County #1, the Labour Party won three seats with 51,545 votes, or 17,182 votes/seat. The Legislative Power Share calculated for these voters is therefore $17,319/17,182 = 100.8\%$, or essentially at parity.

For a voter in the second situation, we assign them a Legislative Power Share in essentially the same way, except that we calculate the votes/seat for the number of compensatory seats. For example, the Centre Party won 18 seats in the counties,

³¹ As noted above, the mathematical and technical details of our Legislative Power Share score calculations for the various PR systems are found in **Exhibit V**.

but their share of the national vote entitled them to 19 seats, so they were awarded one compensatory seat. There were 28,482 voters in four counties where no Centre Party candidate won a list seat, so we regard these voters as collectively sharing representation by the compensatory candidate. The Legislative Power Share calculated for these voters is therefore $17,319/28,482 = 60.8\%$.

- MMP (New Zealand):** As with Norway's List PR system, we consider a voter to receive a share of legislative power if they either voted for a party that elected one or more representatives from the voter's regional list, or voted for a party that received a compensatory (list) seat. For a voter who voted for an elected candidate in their local electoral district, we compute their Legislative Power Score the same way as we do with FPTP, except that we use the total number of seats in the country (120) when computing the average votes per seat. For example, in the 2020 New Zealand election, 2.82 million voters cast votes in the constituency elections, which gives an average of 23,535 votes per seat for the 120 total seats. In Auckland Central, the winning candidate won the seat with 12,631 votes (35.5%), so the Legislative Power Share for the voters who supported this candidate is $23,535/12,631 = 186.3\%$. The Labour Party was entitled to 65 seats based on their share of the party vote, but won only 46 constituency seats, so was awarded another 19 seats from the party lists. There were 387,186 voters across the country who voted for Labour Party candidates locally who did not see their local candidate elected, so we consider these voters to take equal shares in the list MPs ($387,186/19 = 20,378$ voters/seat). Their Legislative Power Share is then calculated as $23,535/20,378 = 115.5\%$.

- STV (Ireland):** Since Ireland's STV system does not have any compensatory layer, the Legislative Power Share score is calculated similarly to how the score is calculated for the voters who elect a regional candidate in Norway. In the 2020 Irish election, 2.2 million voters cast votes for 160 elected representatives, which gives an average of 13,647 votes per seat. To calculate the Legislative Power Share score for a voter who helped elect a representative, we divide this number by the total number of votes that that elected representative received. For example, in Carlow-Kilkenny, Kathleen Funchion was elected with 12,274 votes, so these voters are assigned an LPS score of $13,647/12,274 = 111.2\%$.

88. The distributions of legislative power shares in recent elections in Norway (2013 & 2017, List PR), New Zealand (2017 & 2020, MMP), and Ireland (2017 & 2020, STV) are shown in Figure 14 below, along with the distribution in Canada in the 2019 federal election.

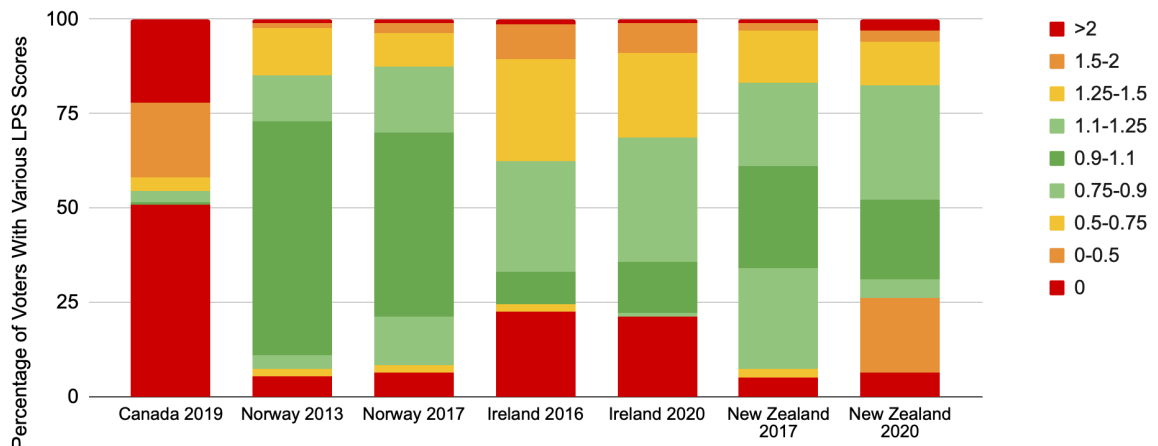


Figure 14. Distributions in Legislative Power Share scores in Canada's 2019 federal election and in recent elections in three selected countries using proportional voting systems.

89. The Legislative Power Score distributions for the three countries using PR illustrate a strong contrast with the distribution for Canada. In Canada, over 50% of voters have a legislative power share of 0 (see large red bar), with the vast majority of the remainder having shares of approximately 1.75 or above. In contrast, all of the countries using PR have much smaller proportions of the voters with a legislative power share of 0, ranging from about 5% in Norway and New Zealand to about 22% in Ireland (which uses comparatively smaller electoral districts and has no cross-district compensatory scheme).
90. The percentage of voters in Canada with LPS scores within +/-50% of parity (yellow and green bars in Figure 13 above) has always been low, and has been decreasing further in recent times – about 20.4% on average prior to 1935, decreasing to 10.5% since 1962, and only 6.9% since 2004 (likely due both to the reduction in disparity in riding size and the increasing vote share attracted by parties other than the largest two in the country). Again, in contrast, the comparator countries using PR have two-thirds to over 90% of their voters having legislative power shares in the range of +/-50% of parity (see Figure 15 below). As discussed in paragraph 86, only 2.4% of Canadian voters since 2004 have had LPS scores within +/-25%, while the comparator countries using proportional representation shown in Figure 14 have had between 38% and 79% of voters with LPS scores in this range.

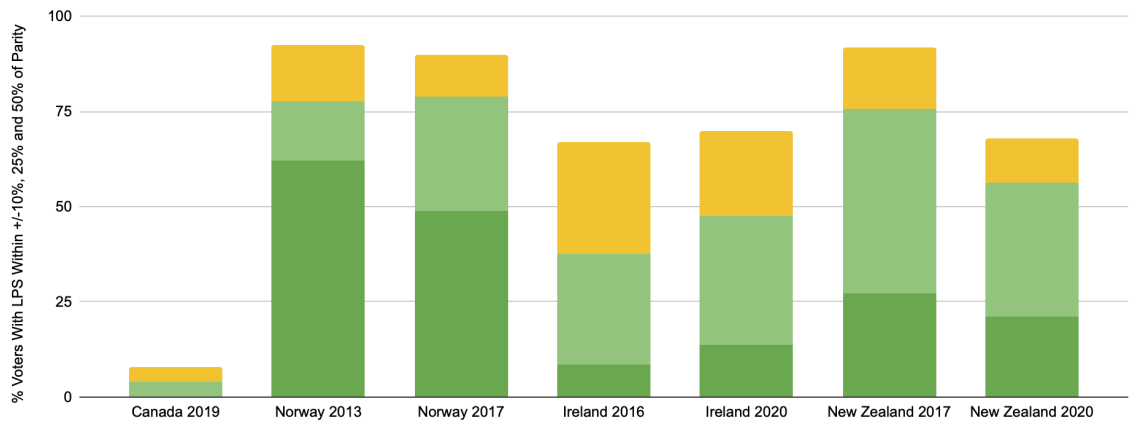


Figure 15. Percentage of voters with a Legislative Power Share score within +/-10% (dark green), +/-25% (dark green + light green) and +/-50% (dark green + light green + yellow) of parity (colours correspond to previous chart). All comparator countries have at least two-thirds of voters with LPS scores within +/-50% of 1 (ranging from 67-92%), while Canada has fewer than 10% of voters within that margin.

Legislative Power Disparity Index: The distribution of legislative power amongst voters

91. The disparity in legislative power between Canadian voters over time is illustrated in

Figure 16. This figure shows the share of total legislative power held by the 10% of voters with the highest shares of legislative power (red), the next 40% (orange), and the bottom 50% (grey), for each of Canada's elections since Confederation:

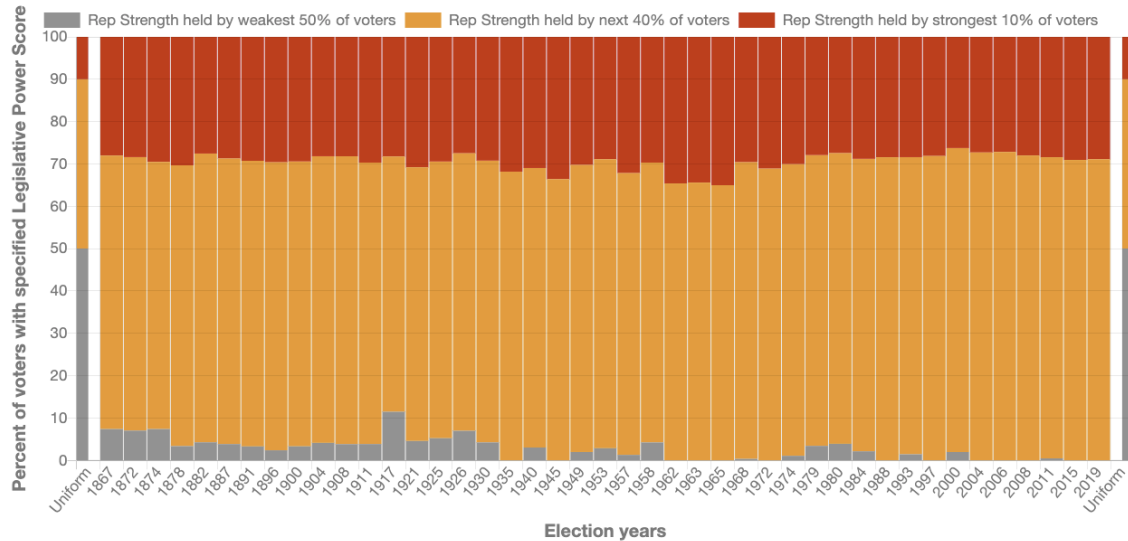


Figure 16. Distribution of Legislative Power Shares across different segments of the voters for all federal elections in Canada since Confederation. The share of legislative power held by the bottom 50% of voters is shown in grey, the next 40% in orange, and the top 10% in red. The bars at either end of the plot show the shares we would expect if legislative power were distributed equitably.

92. In a voting system with perfect legislative power parity, the legislative power shares would be distributed evenly across all voters (as in the separated bars at either side of the figure above). In Canadian elections, however, the 10% of voters with the greatest legislative power scores have consistently held close to 25% of the legislative voting power. The next 40% of voters have consistently held most of the remaining 75% of legislative voting power while the bottom 50% of voters have often held no legislative voting power at all in the past 60 years. In other words, what the above figure shows is that, over the past 60 years, 10% of voters have typically elected about 25% of the MPs; and 50% of voters (those with the lowest legislative power shares) have typically elected no one.

93. The disparity in legislative power between voters in Canadian elections illustrated above can be more precisely visualized and quantified using tools drawn from the political science and economics literature. In this literature, the Gini coefficient is a

commonly-used index to measure disparity in the distribution of a property (e.g., income or wealth); here we use it to measure disparity in the distribution of Legislative Power Share scores. It is calculated by plotting the cumulative percentage of the property against the percentage of the population that holds that property, ordered from those holding the least of the property to the most (this is known as a Lorenz curve).³²

94. The chart below (Figure 17) illustrates Lorenz curves for four elections – one from Canada and one for each of the three example countries using proportional voting systems. In each plot, the blue line indicates an equitable distribution of legislative power - i.e., each voter holding equal shares. The red line is the Lorenz curve, which shows the cumulative shares of legislative power held by the percentage of voters on the horizontal axis. In an election with an equitable distribution of legislative power (i.e., where each voter equally contributed to the election of an MP), the two lines would coincide. In contrast, increasing deviations between the red and blue lines indicate increasing inequities in the distribution of legislative power in the election.

³² The paper by Kedar et al., described earlier (**Exhibit U**), used Lorenz curves and Gini coefficients to quantify disparities in the distribution of their Conversion Ratio metric, which is closely related to our Legislative Power Share score.

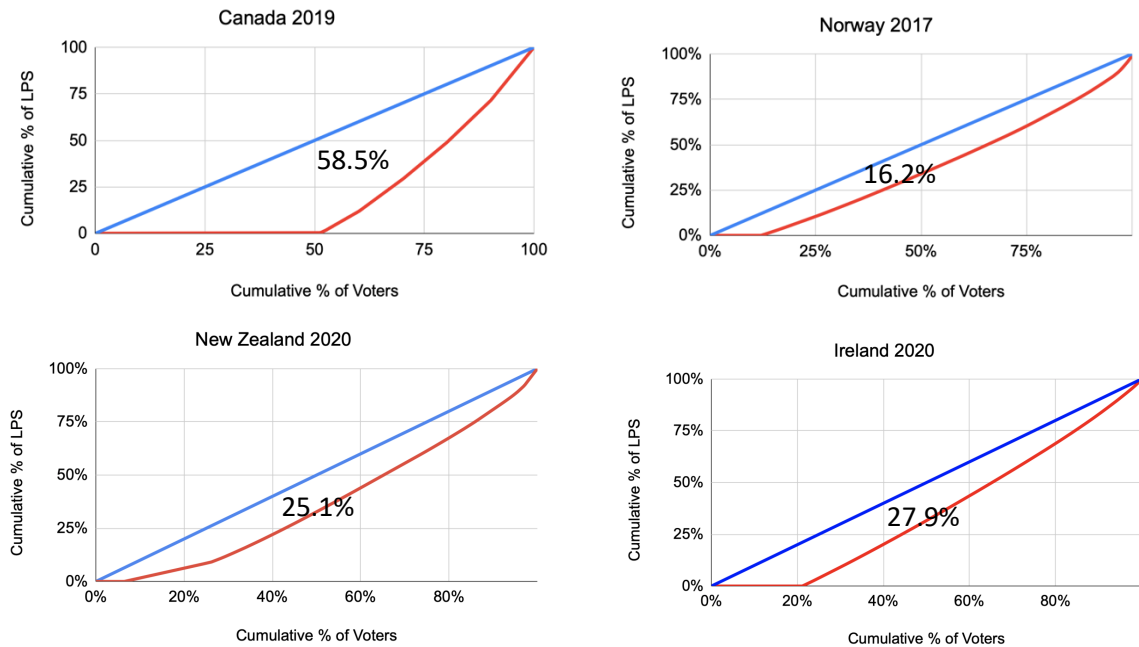


Figure 17. Lorenz curves for selected elections for Canada and three comparator countries illustrating the difference between parity (blue line) and achieved distribution of Legislative Power Share scores (red line). Canada has a much higher percentage of voters with no Legislative Power Share (>50%) and a much larger discrepancy between parity and achieved distribution (area between blue and red curves; corresponding Gini scores overlaid).

95. As was noted earlier, the bottom 51% of voters in the 2019 Canadian federal election held no share of legislative power, while the top 10% of voters held almost 25% (see red line on chart for Canada).

96. The ratio of the area between the blue and red lines in the charts above divided by the area underneath the blue line alone is the Gini coefficient. When applied to this chart of “cumulative share of LPS scores” versus “cumulative share of voters”, we call the Gini coefficient the Legislative Power Disparity Index (LPDI). In principle, the LPDI can range from 0% to 100%, with 0% indicating that all voters held equal legislative power and 100% indicating that a single voter held all the legislative power. In the 2015 and 2019 Canadian federal elections, the Gini coefficient was 58.8% and 58.5%, respectively.

97. The following figure (Figure 18) shows the Legislative Power Disparity Index for all Canadian federal elections since Confederation.

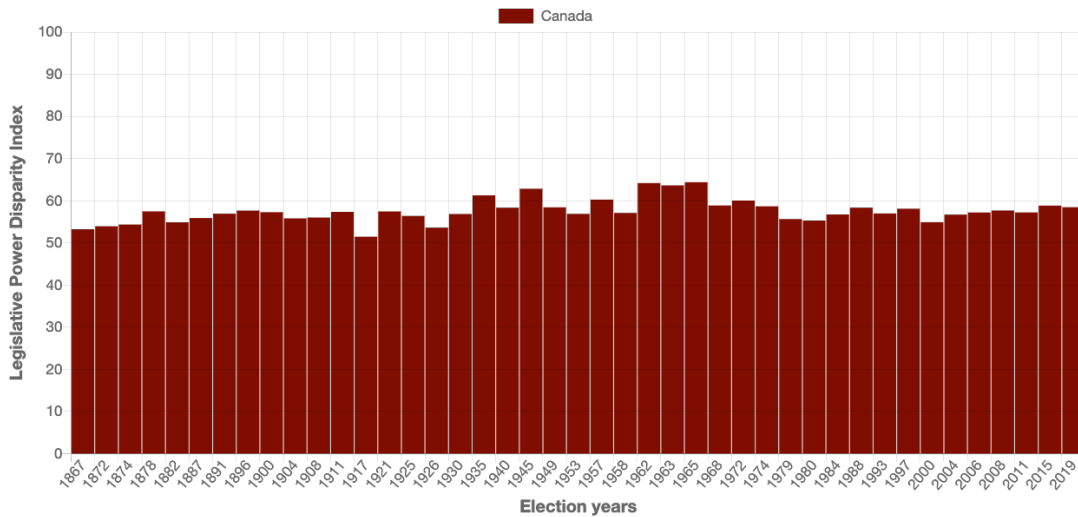


Figure 18. The Legislative Power Disparity Index for all Canadian federal elections since Confederation. The LPDI has averaged 57.4% in the period from 1970 until the present.

98. The LPDI has generally been in the range of 50% to 60% across time, rising slightly from an average of 55.9% prior to 1916 to an average of 57.5% in the period from 1968 until now (following a period of particularly high disparity in the 1960s).
99. This pattern holds similarly in all Canadian regions, as shown in Figure 19 below. While there are variations between regions, the LPDI within each region tends to lie within +/-10% of the national average.

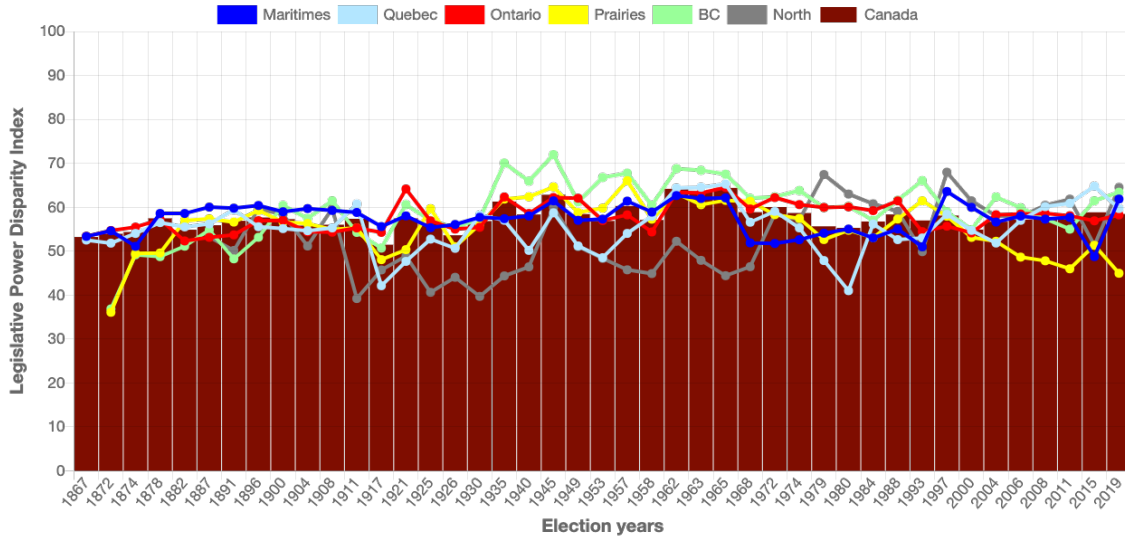


Figure 19. The Legislative Power Disparity Index for all Canadian federal elections since Confederation, overlaid with the LPDI within various regions within Canada.

100. As a point of comparison, the Gini score expressing the disparity in riding sizes (shown in Figure 20) averaged approximately 20% from Confederation until 1965, but has averaged only 11.1% since 1968, when the first federal Election Boundaries Commissions were established, and only 9.3% since 1993, which was the first election following the Supreme Court ruling in the Saskatchewan *Electoral Boundaries Reference* which limited permitted deviations to +/-25% in most circumstances.

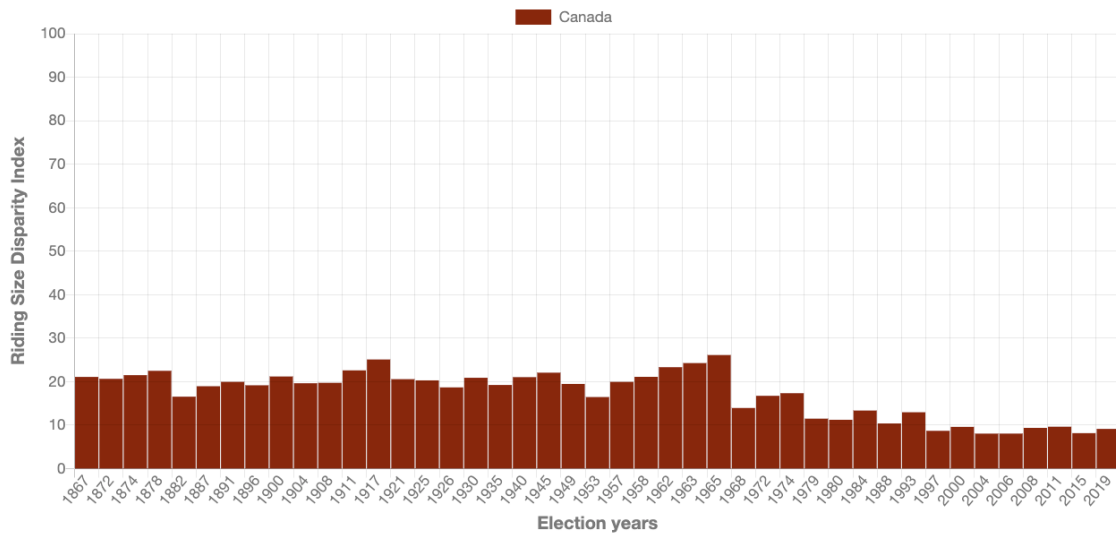


Figure 20. Riding Size Disparity Index (Gini scores) for all Canadian federal elections since 1867. Since the Electoral Boundaries Commissions were established prior to the 1968 election, the index has decreased from roughly 20% in the first century after Confederation to under 10% in recent decades.

101. As a further point of comparison, the Gini score representing the disparity in adjusted after-tax household income in Canada has ranged from 29.9-32.2% in the period of 2000-2019.³³ That is, the disparity in Legislative Power Share scores, which from a normative perspective should in principle be equally distributed across all voters, is nearly twice as high as the disparity in household incomes, which we do not expect to be particularly evenly distributed due to differences in income-earning capacity across households, including differences arising from primary earners being at different stages of their careers across their lifespans. The disparity in Legislative Power Share scores in recent decades has typically been *over five times higher* than the disparity allowed by the courts in the sizes of riding populations.

102. The LPDIs for recent elections in the three comparator countries are in Figure 21. The

³³ See Statistics Canada. Table 11-10-0134-01. Gini coefficients of adjusted market, total and after-tax income. Downloaded from <https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1110013401&pickMembers%5B0%5D=1.1&cubeTimeFrame.startYear=2000&cubeTimeFrame.endYear=2019&referencePeriods=20000101%2C20190101> on April 19, 2021.

Legislative Power Disparity Indices for the elections shown for these three countries are markedly lower than they are for Canada (range: 15% to 29%, vs over 58% in Canada in 2019). That is, the electoral disparity in Canada is on the order of 2 to 4 times greater than is typically found in countries using proportional voting. These values are consistent with the range of values reported by Kedar *et al.* (**Exhibit U**); there, the Gini coefficient applied to their Conversion Ratio of Votes to Seats metric for countries using proportional voting was typically less than about one third that of countries using FPTP voting.

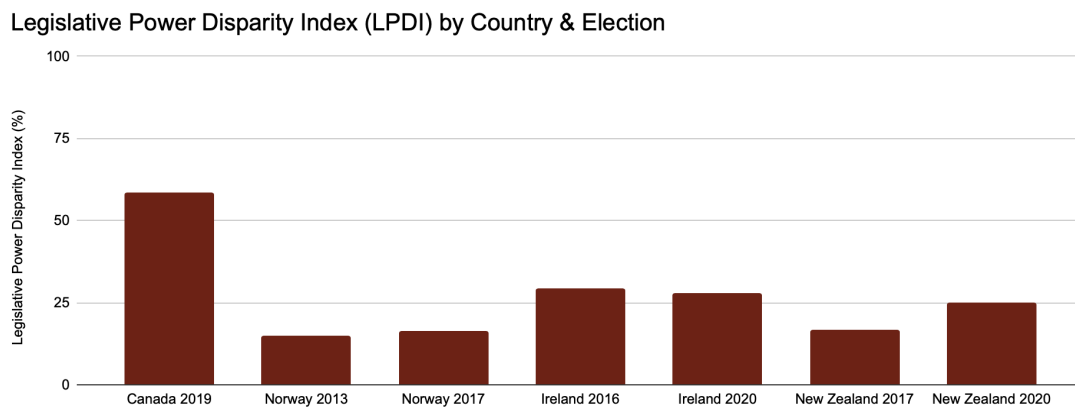


Figure 21. Legislative Power Disparity Indices calculated for Canada in 2019, along with those for two recent elections held in the three comparator countries. All comparator countries show LPDI values less than half that of Canada.

Historical Party-Based Disparity Metrics

103. In addition to the voter-based indices presented and described above, we also calculated historical party-based disparity representations and metrics for reference. Typical party-based metrics compare the national vote share received collectively by candidates of each party with the seat share the voting system awards to candidates

from each party. Such comparisons can usefully illustrate how riding-level disparities can be amplified through aggregation to affect the composition of Parliament.

104. Figure 22 below illustrates, for example, the relationship between vote share earned by candidates running for the top two parties in all federal elections held in Canada since Confederation and the resulting parliamentary seat share awarded by our voting system to these parties. The trendline of the data rises at a much steeper line than the line of proportionality and the first-place finishers have almost always received a greater share of seats than their share of votes. The trend is such that, for vote shares above about 35%, the first-place party's candidates will likely receive about 10-12% additional seats for each 5% increase in their candidates' vote share.

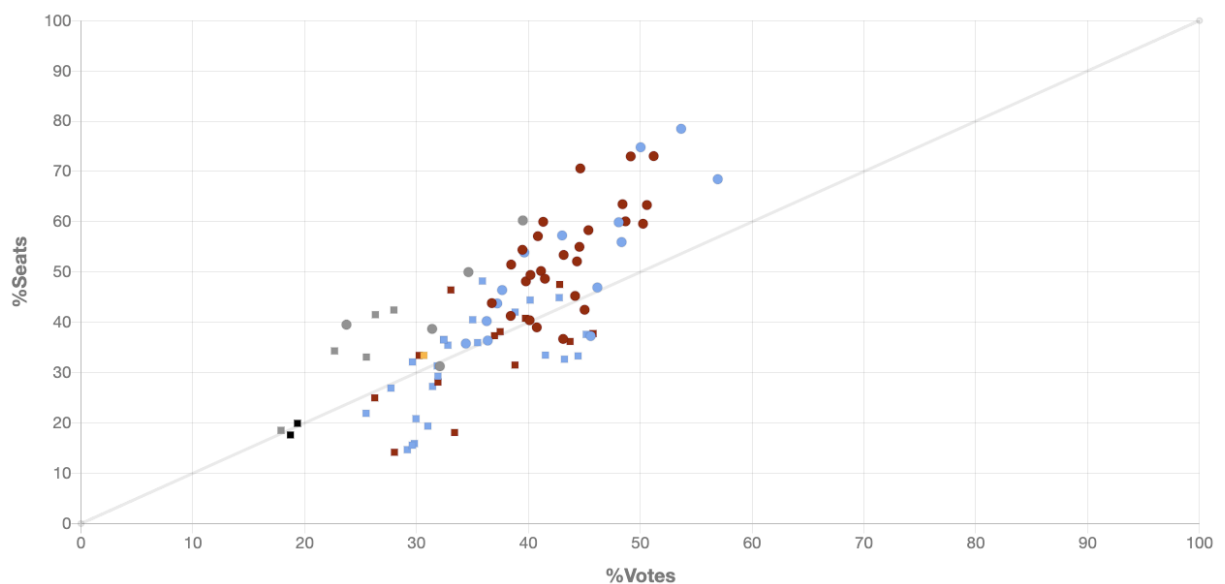


Figure 22. Percentage of seats won by the first and second place parties in all Canadian federal elections since Confederation vs the aggregate vote share won by candidates of these parties. First-place parties are shown as circles, second-place parties as squares. Colour-coding indicates party ideologies – parties generally considered conservative are shown in blue, liberal in red, social democratic in orange, and others in black. Grey symbols show results from Canada's first five elections before the party system was well-established, so they may reflect different dynamics than later elections. The light grey line indicates parity between vote and seat shares.

105. Conversely, a second-place party's candidates frequently win a lower seat share than

their corresponding vote share, and, in modern times, this has almost always been the case once their vote share drops below 30%.

106. In addition, there is considerable variation (and unpredictability, even arbitrariness) in outcome – for example, if a party’s candidates have collectively won 40% of the popular vote, that party’s candidates have historically won anywhere from 30% to 60% of the seats.

107. The disparities shown in the figure above are frequently measured in the political science literature using the Gallagher Index mentioned earlier or similar indices. The 2016 federal Electoral Reform Committee’s first recommendation was that “the Government should, as it develops a new electoral system, use the Gallagher index in order to minimize the level of distortion between the popular will of the electorate and the resultant seat allocations in Parliament. The government should seek to design a system that achieves a Gallagher score of 5 or less.”³⁴ My colleague on this project, Byron Weber Becker, computed the Gallagher Index for all Canadian federal elections since 1867 (shown below in Figure 23).

³⁴ <https://www.ourcommons.ca/DocumentViewer/en/42-1/erre/report-3/page-408>

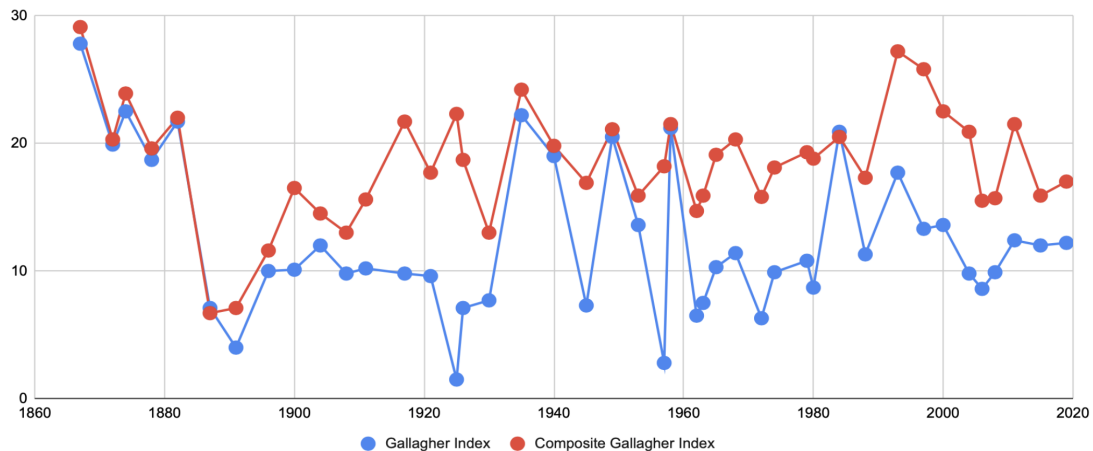


Figure 23. Plot of Gallagher Index (blue) for all Canadian federal elections since 1867. Also shown is the composite Gallagher Index (red) formulated by Byron Weber Becker to account for regional disparities (see footnote).

In the 19 elections over the last 60 years, there has not been a single election with a Gallagher Index lower than the 5% limit the federal Electoral Reform Committee recommended as the outside limit for an acceptable degree of disproportionality, and 13 of the 19 have exceeded 10%.³⁵

PART IV: The “Voter Participation and Strategic Voting” Project

108. In collaboration with political scientist Dr. Fred Cutler (University of British Columbia) and Alex Rivard, I am the coauthor of a paper analyzing voting and participation patterns based on the 2019 Canadian Election Study dataset; the

³⁵ We also note that, because the Gallagher Index (GI) looks at the disparity between vote share and seat share at the national level, it does not take account of regional disparities such as commonly occur in Canada. In effect, the standard Gallagher Index treats a Conservative MP elected in Alberta as providing the same level of representation for a Conservative supporter in Alberta as for one in Toronto, even though the latter has no meaningful connection to or relationship with the Alberta MP and did not contribute to the Alberta MP’s election. Becker therefore computed the Gallagher Index for each province separately and then combined these (with appropriate weighting to account for population variations between provinces) into a Composite Gallagher Index which better reflects the overall level of disparities in the various regions across the country. This Composite Gallagher Index (CGI) is shown in red above. Note that the CGI is typically 50-100% larger than the corresponding GI, and typically three to four times higher than the 5% level that the ERRE recommended as the limit for disproportionality in their report.

Canadian Election Study project is a large-scale academic survey of citizens that has been conducted each election year since 1965 (<http://www.ces-eeec.ca>). The draft paper, titled “Voter Preferences, Local Party Competitiveness, Turnout, and Strategic Voting: Deterrents to Voting are Unequally Distributed”, has been submitted for publication to the Canadian Journal of Political Studies.³⁶ Attached to this affidavit and marked as **Exhibit W** is a copy of this paper. In our study, we found the following:

109. The more a voter believes that their candidate or party is likely to win election, the more likely the voter is to say they are certain to vote. As the voter perceives declining odds that their intended candidate or party will win election, they become less certain of voting. This is illustrated in Figure 24 and Figure 25 below.
110. Figure 24 shows the distribution of voters’ stated level of intention to vote (Certain, Likely, or Unlikely) as a function of the voter’s perception of how well the party they intend to vote for will do in their local riding (‘1’ indicates the voter thinks the party they intend to vote for will come first in their local riding, ‘2’ second, etc.). This figure shows that the better a voter expects the party they plan to vote for to do locally, the more likely they are to be certain to vote. On average, a voter who expects the party they plan to vote for to come in third or lower is about 5% less likely to be certain to vote than a voter who expects the party they plan to vote for to come in first or second, and 18% less likely to be certain to vote if they expect the party they plan to vote for will come in fifth or lower.

³⁶ Draft paper available at <https://preprints.apsanet.org/engage/apsa/article-details/5fa32d5ecfc2cb001205dc82>; submitted Nov 5, 2020.

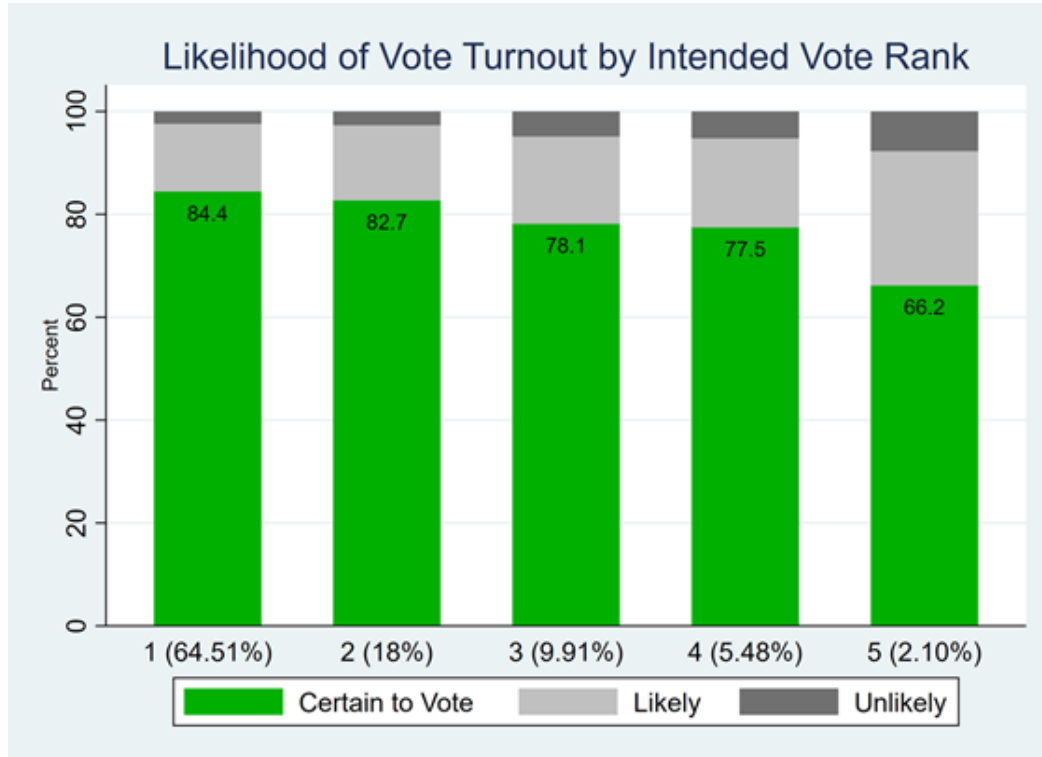


Figure 24. Distribution of voters' stated level of intention to vote (Certain, Likely, or Unlikely) as a function of the voter's perception of how well the party they intend to vote for will do in their local riding (Rank 1 = first place). The numbers in parentheses indicate the proportion of voters who feel that the party they intend to vote for will have the corresponding local rank.

111. Because some parties are more likely to place in the top two spots in most ridings, this dynamic ends up having a differential effect on voters who intend to vote for different parties. Figure 25 below shows the distribution of expressed likelihood of voting by the party that voters intend to vote for. Voters who intend to vote for the two largest parties (the Liberal and Conservative parties), as well as the Bloc Quebecois, which tends to be a leading party in Quebec, express the strongest likelihood of being certain to vote (ranging from 81.7% to 86.5%). Voters who intend to vote for parties that are generally less likely to place first or second in local ridings express markedly lower likelihoods of being certain to vote (73.8% to 76.9%).

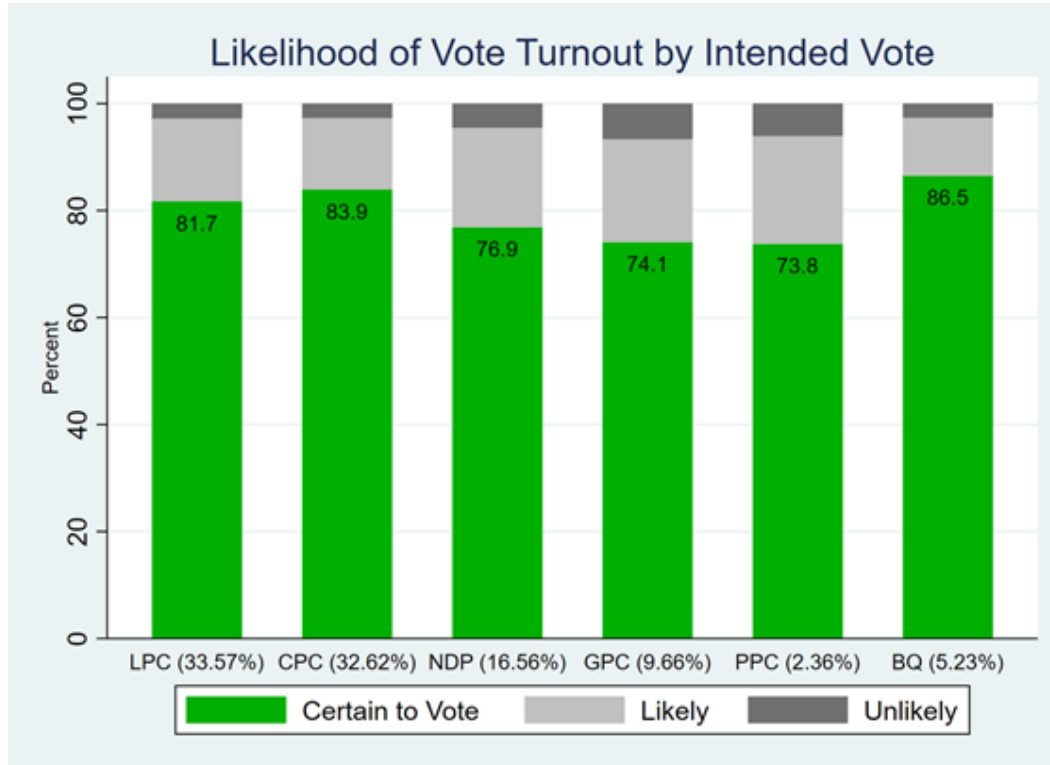


Figure 25. Distribution of voters’ stated level of intention to vote (Certain, Likely, or Unlikely) as a function of which party the voter intends to vote for). The numbers in parentheses indicate the proportion of voters who plan to vote for the corresponding party.

112. We estimate that this difference in likelihood of being certain to vote means that over 180,000 Canadian voters were not “certain to vote” because of their perception that the candidate or party they intended to vote for was not likely to place first or second locally – that is, to stand a strong chance of winning locally. This is significant evidence that FPTP dissuades many voters from voting.
113. In the 2019 Canadian election, supporters of the NDP, Green Party, and People’s Party were much more likely than supporters of the two biggest parties to vote for a party other than the one they preferred (30%, 52%, and 57%, respectively, vs 11%, 8% and 14% for the LPC, CPC and BQ, respectively, as shown in Figure 26 below.

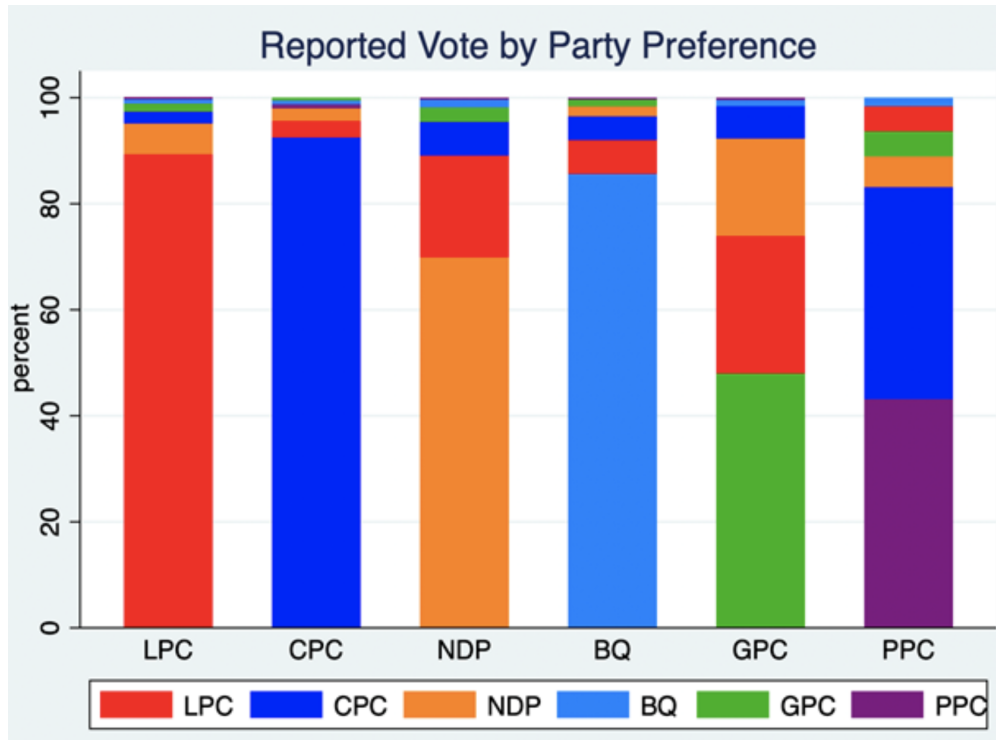


Figure 26. Distribution of post-election reported vote by ‘preferred party’. This figure shows, for example, that about 90% or more of voters who expressed a preference for the Liberal or Conservative parties reported voting for a Liberal or Conservative candidate, respectively. In contrast, under 50% of voters who preferred the Green Party or the People’s Party reported voting for a Green Party or People’s Party candidate, respectively.

114. We estimated the overall “strategic voting” rate in the 2019 Canadian election to be about 7%, but this number is comprised of between 35% and 45% of voters who believe that their preferred party is likely to place between 3rd and 5th in their local riding.³⁷ Supporters of the People’s Party showed the highest rate of strategic voting (40.2%), followed by Green Party supporters (33.3%) and NDP supporters (14.6%). Fewer than 2% of Liberal Party, Conservative Party and Bloc Quebecois supporters reported voting strategically. In short, the pressure to vote strategically is felt dramatically disproportionately by supporters of parties whose preferred candidates

³⁷ We defined strategic voting as a voter reporting voting for a non-preferred party that the voter predicted would come first or second locally when the voter predicted that their preferred party would come third or lower locally.

are unlikely to win local seats under the FPTP voting system.

115. The conclusion of our paper states “We have demonstrated that voters in Canada have a weaker intention to vote, vote at lower rates, and engage more in strategic voting when they believe their preferred party is less likely to win a local seat. This finding provides greater insight into the more widely-established finding that proportional voting systems tend to result in higher voter turnout than do plurality voting systems and provides evidence that plurality voting systems pose impediments to the full and honest participation of voters with political perspectives that happen to be in a minority in their electoral district.”

PART V: The “Parity Across Time” Analysis Project

116. Some might argue that even if voters are not represented by the candidate they voted for in a given election, over time most MPs will be displaced by an MP from a different party and therefore voters with a different view will eventually see someone elected who better represents their perspective and interests.
117. To test this contention, Byron Weber Becker and I performed a “*Parity Across Time*” (continuity) analysis on those ridings in Canada that either kept the same (or a closely-related) riding name or the same MP across sequential elections³⁸ and then plotted the percentage of time the various parties spent holding the seat versus the average

³⁸ We included in our analysis all ridings that were identifiably contiguous for at least four elections between the 1979 and 2019 federal elections. We chose these dates based on a paper by Semra Sevi, Who Runs? Canadian Federal and Ontario Provincial Candidates from 1867 to 2019, *Canadian Journal of Political Science* (2021), 1–6, which shows that the average number of candidates per riding has been relatively constant since 1979, so this set of elections share a similar competitive landscape.

percentage of the vote those parties received over that set of sequential elections.

118. The results for Canada as a whole are shown in Figure 27 below (the full details of this analysis are posted on <http://election-modelling.ca>³⁹ and the relevant section of the website is attached to this affidavit as **Exhibit X**). If it is true that all voters are treated equally over time, even if not in the present election, then we would expect the points in the plot to lie along the diagonal line of parity shown in this plot. Clearly, the data shows a far different result that is instead similar to the results we saw in the data on individual elections shown in Figure 22: on average, once a party attracts over about 30% support, its voters tend to see candidates from that party in office a disproportionately higher portion of the time. There are numerous ridings where voters can support one party with upwards of 30% of the vote, yet never see any candidate from that party elected over time, while, conversely, there are numerous ridings where as few as 40% of the voters see a candidate from the party they voted for elected 100% of the time.

³⁹ The regional breakdowns presented at election-modelling.ca show similar overall patterns to what is shown for Canada as a whole, although different parties exhibit relative over-representation in their regions of greatest relative strength and relative under-representation in their regions of lowest relative strength. For example, the Liberal Party is comparatively over-represented in the Atlantic provinces and comparatively under-represented in the Prairie provinces, while the reverse is true for the Conservative Party.



Figure 27. Percentage of time that a particular party or ideology (indicated by colour of dots) held power in individual Canadian federal ridings over multiple sequential elections vs the average vote share received by that party over that series of elections. The areas of the dots are proportional to the total voter-days of representation. The transparent dots represent the mean % time in office vs the mean % votes earned by party/ideology. The diagonal line represents ‘temporal parity’ – i.e., a point on this line indicates that if a party wins a given percentage of the vote on average over time, it also holds a seat for the same percentage of the time. Points above the line indicate that a party holds a seat for a larger percentage of the time than their average percentage of the vote. All ridings shown were identifiably contiguous over at least four elections including the 2019 federal election and extending backwards in time to as early as 1979.

119. For example, the larger orange dot at 40% of votes earned and 100% time in office (see label ‘A’) corresponds to the Burnaby South riding, which, since 1979, has consistently returned an NDP Member of Parliament, despite candidates from the Conservative Party (or its predecessors) attracting 27.4% of the vote on average and candidates from the Liberal Party 24.1% over the same time frame. Conversely, the smaller blue and red dots near 33% of votes earned and no time in office (see label ‘B’) correspond to (respectively) Skeena-Bulkley Valley and Haldimand-Norfolk, where, in Skeena-Bulkley Valley, candidates from the Conservative Party (and its predecessors) have attracted 33.6% of the vote, on average, since 2004 and, in Haldimand-Norfolk, candidates from the Liberal Party have attracted 33.0% of the vote, on average, over the same period, but neither party has ever won a seat in those

ridings in that period.

120. If we rank the ridings from most over-represented (the dots towards the upper left of the plot, where the distance between the dot and the line of parity is maximal) to most under-represented (the dots towards the lower right), we see that there are both ideological and demographic biases in which voters are over- or under-represented. Interestingly, both the most over- and under-represented voters tend to be those who support the Liberal or Conservative parties. The most over-represented voters tend to be those where the top-ranked party typically attracts about 40-50% of the vote and wins almost all the time, while the most under-represented voters are those where the party they vote for receives between a quarter and a third of the vote yet almost never wins a seat.
121. Table 1 and Table 2 below show the twenty-five most over-represented ridings (the dots towards the upper left of the plot above, where the distance between the dot and the line of parity is maximal) and the twenty-five most under-represented ridings (the dots towards the lower right). In these tables, we see that there are both ideological and demographic biases in which voters are over- or under-represented.
122. The most over-represented voters (Table 1) are predominantly constituted by those who vote for the Conservative Party (17 of the 25 ridings); most of these are ridings in the less urban parts of Ontario where the Conservative Party has historically attracted roughly 50% of the vote and nearly always wins the seat. However, the top two most over-represented ridings are held by the NDP in BC – there, the NDP has historically won an average of 40-44% of the vote and their candidates have won every election.

Liberal Party voters tend to be most over-represented in urban ridings (Ottawa and Montreal in this list).

Table 1. The twenty-five most over-represented ridings (ranked by size of disparity between the average time an MP from the indicated party holds the seat and the average vote share the indicated party receives in that period).

Riding	Province	Party	Avg Vote Share	Avg Time as MP	Disparity	Elections
Burnaby South	BC	NDP	40.0%	100.0%	60.0%	31 - 43
New Westminster--Burnaby	BC	NDP	43.5%	100.0%	56.5%	38 - 43
Haldimand--Norfolk	ON	CP	47.3%	100.0%	52.7%	38 - 43
Durham	ON	CP	47.7%	100.0%	52.3%	38 - 43
Perth--Wellington	ON	CP	47.8%	100.0%	52.3%	38 - 43
Dufferin--Caledon	ON	CP	48.4%	100.0%	51.6%	38 - 43
Bruce--Grey--Owen Sound	ON	CP	48.8%	100.0%	51.2%	38 - 43
Skeena--Bulkley Valley	BC	NDP	48.9%	100.0%	51.1%	38 - 43
Niagara West	ON	CP	50.0%	100.0%	50.0%	38 - 43
Mégantic--L'Érable	QC	CP	40.8%	90.6%	49.8%	38 - 43
Hamilton Centre	ON	NDP	50.2%	100.0%	49.8%	38 - 43
Haliburton--Kawartha Lakes--Brock	ON	CP	50.8%	100.0%	49.2%	38 - 43
Lambton--Kent--Middlesex	ON	CP	51.6%	100.0%	48.4%	39 - 43
Flamborough--Glanbrook	ON	CP	42.6%	90.6%	48.1%	38 - 43
Wellington--Halton Hills	ON	CP	52.7%	100.0%	47.3%	38 - 43
York--Simcoe	ON	CP	52.7%	100.0%	47.3%	38 - 43
Ottawa South	ON	LP	52.8%	100.0%	47.2%	34 - 43
Cape Breton--Canso	NS	LP	53.3%	100.0%	46.7%	37 - 43
Notre-Dame-de-Grâce--Westmount	QC	LP	53.6%	100.0%	46.4%	36 - 43
Bellechasse--Les Etchemins--Lévis	QC	CP	44.3%	90.6%	46.4%	38 - 43
Langley--Aldergrove	BC	CP	53.9%	100.0%	46.2%	38 - 43
Stormont--Dundas--South Glengarry	ON	CP	54.8%	100.0%	45.2%	38 - 43
Ottawa--Vanier	ON	LP	55.0%	100.0%	45.0%	31 - 43
Kitchener--Conestoga	ON	CP	45.7%	90.3%	44.6%	39 - 43
Kamloops--Thompson--Cariboo	BC	CP	38.8%	82.4%	43.6%	37 - 43

123. The most under-represented voters (Table 2) mainly voted for either the Conservative Party (10 of the top 25 ridings) or the Liberal Party (9 of the top 25 ridings). The majority of these most-under-represented voters also come from Ontario (15 of the top 25 ridings), with 4 ridings in each of BC and Quebec and 1 in each of Saskatchewan, and Newfoundland and Labrador. In most of these ridings, the associated party received an average of close to 30% of the votes over the period, but typically never saw one of their candidates elected. Perhaps not surprisingly, these most-under-represented ridings are located in similar places to the most-over-represented ridings – 15 of the 25 ridings show up in both lists.

Table 2. The twenty-five most under-represented ridings (ranked by size of disparity between the average time an MP from the indicated party holds the seat and the average vote share the indicated party receives in that period).

Riding	Province	Party	Avg Vote Share	Avg Time as MP	Disparity	Elections
Skeena--Bulkley Valley	BC	CP	33.6%	0.0%	-33.6%	38 - 43
Haldimand--Norfolk	ON	LP	33.0%	0.0%	-33.0%	38 - 43
Coast of Bays--Central--Notre Dame	NL	CP	30.3%	0.0%	-30.3%	38 - 43
Durham	ON	CP	30.1%	0.0%	-30.1%	38 - 43
Dufferin--Caledon	ON	CP	29.8%	0.0%	-29.8%	38 - 43
Kenora	ON	NDP	29.6%	0.0%	-29.6%	38 - 43
Niagara West	ON	LP	29.4%	0.0%	-29.4%	38 - 43
Wellington--Halton Hills	ON	LP	29.0%	0.0%	-29.0%	38 - 43
Kamloops--Thompson--Cariboo	BC	NDP	28.6%	0.0%	-28.6%	37 - 43
Perth--Wellington	ON	LP	28.5%	0.0%	-28.5%	38 - 43
Stormont--Dundas--South Glengarry	ON	LP	28.2%	0.0%	-28.2%	38 - 43
Scarborough--Agincourt	ON	CP	28.1%	0.0%	-28.1%	34 - 43
Laval--Les Îles	QC	BQ	27.8%	0.0%	-27.8%	35 - 43
Bruce--Grey--Owen Sound	ON	LP	27.8%	0.0%	-27.8%	38 - 43
Burnaby South	BC	CP	27.4%	0.0%	-27.4%	31 - 43
Portneuf--Jacques-Cartier	QC	BQ	27.3%	0.0%	-27.3%	39 - 43
New Westminster--Burnaby	BC	CP	27.3%	0.0%	-27.3%	38 - 43
Ottawa South	ON	CP	27.3%	0.0%	-27.3%	34 - 43
York--Simcoe	ON	LP	27.0%	0.0%	-27.0%	38 - 43
Hamilton Mountain	ON	CP	28.0%	1.8%	-26.2%	31 - 43
Thunder Bay--Rainy River	ON	CP	26.0%	0.0%	-26.0%	38 - 43
Haliburton--Kawartha Lakes--Brock	ON	LP	26.0%	0.0%	-26.0%	38 - 43
Abitibi--Baie-James--Nunavik--Eeyou	QC	LP	25.9%	0.0%	-25.9%	38 - 43
Prince Albert	SK	NDP	25.9%	0.0%	-25.9%	36 - 43
Honoré-Mercier	QC	BQ	25.9%	0.0%	-25.9%	38 - 43

124. In addition to the 25 ridings shown in Table 2, there are many other ridings where a substantial portion of the voters vote for a particular party, yet where that party's candidates never win a seat. There are many voters who cast votes for the Green Party, for populists, and for the NDP in this situation – 95% of the votes considered in this analysis that were cast for the Green Party resulted in no elected MP in any of the elections considered, 50.0% of votes cast for populists, and 43.7% of votes cast for the NDP. In contrast, only 14.0% of votes cast for the Liberal Party, 11.5% of votes cast for the Bloc Québécois and 10.5% of votes cast for the Conservative Party never resulted in election of an MP from that party over the elections included in this analysis.⁴⁰

⁴⁰ Note that average support levels may have changed significantly over time, so the average level of support shown on the plot may under- or over-state recent election results. The Green Party, in particular, has seen its average level

PART VI: Summary

1. In summary, this affidavit has presented the following facts:
 - a. Fair Voting BC is a well-established non-profit society with a long-term record of advocating for electoral reform.
 - b. Canada's FPTP voting system routinely elects a majority of MPs without majority support.
 - c. Approximately half the votes cast in a typical Canadian FPTP election are not cast for winning candidates and so do not result in Parliamentary representation for the voters who cast these 'wasted' votes.
 - d. The 'wasted vote' phenomenon is not limited to supporters of any particular party, but instead affects voters who support all of the various parties (to differing extents in different regions of the country).
 - e. In recent decades, the elected MPs from parties who form majority governments in Canada have typically received little more than a quarter of

of support rise significantly in recent elections, from less than 1% on average in the 2000 election and earlier, to between 3% and 7% in the elections since 2004. Note also that there are some situations, notably those involving populist parties or candidates, where a party played a dominant role in a small number of elections and were not otherwise a significant force. For example, in the Manitoba riding of Selkirk-Interlake-Eastman (shown with a populist vote share of 3% and a representation share of 15% over 8 elections (36th to 43rd Parliaments, 1997-2019)), the bulk of the populist vote occurred in the first two of these elections in which Reform candidate Howard Hilstrom won the seat with 28% of the vote in 1997 and then again (this time as an Alliance candidate) with 44% of the vote 2000. In 2004, the Alliance had merged with the Progressive Conservatives to form the Conservative Party, which won the seat with 47% of the vote. If we had treated the transitional candidates as being part of a broader conservative 'family', then the plot would have shown this riding plotted at 55% vote share and 100% seat share.

the votes cast.

- f. In recent decades, candidates from a party that forms a majority government have typically received less than 40% of the total votes cast.
- g. Only about a third of ridings are considered to be 'in play' in any given election (i.e., 'swing' seats, with vote margins for the winner under about 10%). Similarly, another third are considered to be so safe that a change in the party affiliation of the winner of the seat is extremely unlikely.
- h. Because small vote shifts in selected ridings can swing results so dramatically, small shifts in electoral boundaries can significantly affect the outcome of an election, despite no underlying shift in the votes cast by voters.
- i. The combination of wasted votes, swing seats and voter distribution relative to electoral boundaries results in significant disproportionality in outcome – a party whose candidates win many more votes than those of another party can nonetheless receive far fewer seats, and parties whose candidates win a given fraction of the vote can receive markedly different numbers of seats in the same or different elections.
- j. Various proportional voting systems are widely used in other countries.
- k. The distribution in sizes of ridings in Canada is relatively narrow, with approximately 90% of ridings since 1991 lying within +/-25% of parity.
- l. The Representation Metric, which describes the percentage of voters who

have voted for an elected MP, has steadily decreased over time, from an average of 56.4% prior to 1935 to an average of only 49.8% since 1984, with only minor variations between regions within Canada.

- m. In the three comparator countries discussed in this affidavit, all of which use various forms of proportional voting, the Representation Metric ranges from about 75% to as high as 95%.
- n. The distribution in the Legislative Power Share score is much more inequitably distributed in Canada than the distribution of riding sizes. Only 2.4% of voters since 2004 have had a Legislative Power Share score within +/-25% of parity. This number has decreased over time.
- o. In contrast, the comparator countries using proportional voting have between 38% and 79% of voters having a Legislative Power Share score within +/-25% of parity.
- p. The disparity in the distribution of Legislative Power Share scores can be quantified using the Gini coefficient to compute a Legislative Power Disparity Index (LPDI). The LPDI has averaged 57.5% in Canada since 1968. It has slightly risen from early Canadian elections.
- q. In contrast, the LPDI for the three comparator countries has been in the range of 15% to 29%.
- r. For comparison, the corresponding Gini coefficient for the distribution of riding sizes in Canada has averaged only 11.1% since 1968. That is, the

disparity in distribution of Legislative Power Share scores is over five times larger than the disparity in distribution of riding sizes, and two to four times larger than the disparity in Legislative Power Share scores for the comparator countries.

- s. The Gallagher Index (a measure of aggregated disproportionality between the vote share received by candidates of the various parties and the resulting seat shares) has consistently exceeded the 5% limit specified as desirable by the 2016 federal Electoral Reform Commission and has been beyond 10% in 13 of the past 19 federal elections.
- t. In our Voter Participation and Strategic Voting project, we demonstrated that voters who expect the party they intend to vote for to come in third place or lower in their local riding are 5% less likely to state that they are certain to vote than voters who expect the party they plan to vote for to come in first or second place in their local riding.
- u. This effect is disproportionately felt by voters who intend to vote for certain parties. Voters who plan to vote for the NDP or Green Parties express a certainty to vote of only 74% to 77%, as compared with voters who plan to vote for the Liberal Party (82%), Conservative Party (84%) or the Bloc Quebecois (87%).
- v. Similarly, voters who preferred one of the latter three parties were much less likely to report having switched their vote to another party in the 2019 election (only 8% to 14%) than voters who preferred the NDP, Green Party or

People's Party (30% to 57%).

- w. Closely correlated to the above finding, voters who preferred to vote for the NDP, Green Party or People's Party in 2019 were much more likely to have voted strategically (15% to 40%) than voters who preferred the Liberal Party, Conservative Party or Bloc Quebecois (<2%).
- x. The "Parity Across Time" project demonstrated that disparities that arise in a given election are not generally compensated for over time; there are many ridings in which an MP from a given party holds the seat 100% of the time despite that party's candidates receiving as little as 40% of the vote on average over multiple elections; conversely, there are many ridings where candidates from a given party are never elected as MPs despite receiving as much as 33% of the vote on average over multiple elections.
- y. Over- and under-representation affects voters who vote for all parties. The most over-represented voters in the country are predominantly Conservative Party voters (17 of the top 25 most over-represented ridings) and are mostly concentrated in Ontario (16 of the top 25). The most under-represented voters mainly voted for either the Conservative Party (10 of the top 25 ridings) or the Liberal Party (9 of the top 25 ridings). The majority of these most-under-represented voters also come from Ontario (15 of the top 25 ridings).
- z. Finally, there were significant variations across supporters of different parties in the fractions of voters who never saw an MP from the party they voted for elected: 95% of the votes cast for the Green Party never resulted in an elected

MP in any of the elections considered, 50.0% of votes cast for populists, and 43.7% of votes cast for the NDP. In contrast, only 14.0% of votes cast for the Liberal Party, 11.5% of votes cast for the Bloc Quebecois and 10.5% of votes cast for the Conservative Party never resulted in election of an MP from the respective parties across the periods considered.

AFFIRMED BEFORE ME, by videoconference,)
from the City of Vancouver, in the Province of)
British Columbia, to the City of Toronto, in the)
Province of Ontario, on the _____ day of)
_____, 2021.)

)
) **Antony Hodgson**

Commissioner of Oaths, etc.

LIST OF EXHIBITS

- Exhibit A. Fair Voting BC's Constitution
- Exhibit B. A Smartier Way to Vote
- Exhibit C. Understanding Proportional Representation
- Exhibit D. Understanding Proportional Representation – Montreal Example
- Exhibit E. Fair Voting BC Electoral History Quiz
- Exhibit F. *Effective Vote* analysis posted on <http://election-modelling.ca>
- Exhibit G: Gerrymander Wheel (STV Action, UK)
- Exhibit H. Norwegian ballot
- Exhibit I. Irish ballot
- Exhibit J. New Zealand ballot
- Exhibit K. IDEA electoral system families diagram
- Exhibit L. ERRE modelling paper (Byron Weber Becker and Antony Hodgson)
- Exhibit M. Law Reform Commission Report
- Exhibit N. FVBC submission to ERRE – Civil Right Case for Voting Reform
- Exhibit O. FVBC Presentation to ERRE
- Exhibit P. Reflections and Final Words of Advice - personal submission to ERRE
- Exhibit Q. FVBC submission to BC government
- Exhibit R. Make Every Voter Count submission to BC government
- Exhibit S. FVBC post-referendum survey
- Exhibit T. ERRE final report
- Exhibit U. Kedar paper – Are Voters Equal Under Proportional Representation?
- Exhibit V. *Parity in Legislative Power* project details posted on <http://election-modelling.ca>
- Exhibit W. Deterrents to Voting paper submitted to Canadian Journal of Political Science
- Exhibit X. *Parity Across Time* project details posted on <http://election-modelling.ca>