



Winning Odds for Pakatan Harapan in Johor (GE14)

January 21st 2018

An overview of electorate data and basic forecasted GE14 results based on analyses of past elections, individual voting patterns and election simulations.

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1. Introduction

On January 20th 2018 a detailed listing of the 56 state seats being contested by Pakatan Harapan (PH) component parties in Johor was published by Malaysiakini (<https://www.malaysiakini.com/news/409412>). Based on this listing, the seat division is as follows:

- 18 seats contested by PPBM
- 12 seats contested by PKR
- 14 seats contested by DAP
- 12 seats contested by AMANAH

This report provides an overview of the seats contested by component parties in PH and the winning odds for each seat. Detailed election forecast results are not available at the moment due to the cost involved in running simulations, however the winning odds will give a rough idea of the swing in support that PH needs to win control of the state.

Analysis was performed based on the 2017 1st Quarter (Q1) electoral roll, State and Federal seat results from the 13th General Election (GE13) and individual historical voting patterns from GE12 (2008) and GE13 (2013).

2. List of Acronyms

The following table shows a list of acronyms used in this document.

Acronym	Full name
PR	Pakatan Rakyat (coalition of PKR, DAP and PAS)
PH	Pakatan Harapan (coalition of PKR, DAP and AMANAH)
BN	Barisan Nasional
UMNO	United Malays National Organisation
GERAKAN	Parti Gerakan Rakyat Malaysia (also known as PGRM)
MCA	Malaysian Chinese Association
MIC	Malaysian Indian Congress
PBB	Parti Pesaka Bumiputra Bersatu Sarawak
PKR	Parti Keadilan Rakyat
DAP	Democratic Action Party
AMANAH	Parti Amanah Negara
PAS	Parti Islam Se-Malaysia
PPBM	Parti Pribumi Bersatu Malaysia
EC	Election Commission of Malaysia
GE12	12 th General Election (held in March 2008)
GE13	13 th General Election (held in May 2013)

3. Methodology

Prior to the 13th General Election (GE13) we came up with a methodology of predicting election results based on voting patterns in previous elections

(<https://politweet.wordpress.com/2013/05/05/predictions-for-malaysias-general-election-ge13-pru13/>).

Our method relied on mapping **polling lane results** to individual voters. This process assigned probability values (chance of turnout; chance of voting for each coalition) to the voter that was not affected if they migrated to another constituency. This is important because between GE12 and GE13 527,849 voters migrated between different constituencies.

The impact of voter migration cannot be measured for a single seat just by comparing results of GE12 and GE13 for that seat. An analysis of the whole country needs to be performed. New voter

registrations, transferred voters, voters passing away and voters no longer eligible to vote are factors that require deep analysis.

After GE13 we were able to apply the same estimation method to voters based on GE13 results. By comparing the shift in probabilities we are able to calculate the swing in support for each coalition. Because we base our calculations on individual voters, we are able to calculate shifts in support based on combinations of the following dimensions:

- By Age
- By Race
- By Gender
- By Urban Development Category (rural / semi-urban / urban)
- By Parliament/State Assembly Seat
- By Polling District
- By Locality
- By Seats Won by Specific Parties

The most reliable metric is age because voters are separated into polling lanes based on age. The majority of polling lanes contain between 350 – 700 voters.

How probabilities were assigned

1. The ethnic composition of each polling lane was calculated. This was used to adjust the probability levels for individual voters.
2. The polling lane result was used to generate a probability figure e.g. 60% of votes for BN and 40% of votes for PR means a base probability value of 60% pro-BN and 40% pro-PR is generated for all voters in that polling lane.
3. The base probability was then adjusted based on the ethnic composition. This assumes voter turnout was evenly spread among all ethnic groups. For example:
 - a. In a polling lane of 600 voters (assume 100% turnout), BN received 360 votes (60%)
 - b. 420 voters (70%) of the voters are Malay and 180 voters (30%) are Chinese.
 - c. That means BN received votes from at least 180 Malays and at most 360 Malays.
 - d. $180/420 = 42.86\%$ of Malays
 - e. $360/420 = 85.71\%$ of Malays
 - f. BN received votes from 42.86% - 85.71% of Malay voters. This is the range of probability that Malay voters in that lane voted for BN. The average probability is a 64% chance of voting BN.
 - g. For the 180 Chinese voters, BN did not need their vote. BN received votes from 0% - 100% of Chinese voters. This translates to an average probability of 50% chance of voting for BN. This also applies to the probability that they voted PR.
 - h. For PR, they received 240 votes (40%). Based on the ethnic ratio, at least 60 Malays voted for PR.
 - i. $60/420 = 14.29\%$ of Malays
 - j. $240/420 = 57.14\%$ of Malays
 - k. PR received votes from 14.29% - 57.14% of Malays. This translates to an average probability of 35.7% that Malay voters in that lane voted for PR.
 - l. A non-racial method would assign a probability of 60% for BN and 40% for PR. By adjusting for race we identified the higher probability of Malays voting for BN and the higher probability of Chinese voting for PR (50% instead of 40%).

4. Any voter belonging to a minority group small enough to not affect the polling lane result either way is also assigned a probability of 50%. For example, if 5% of a polling lane's voters are of Race X and the rest are Race Y, and the result is 90% in favour of Party A, then voters of Race X are assigned a value of 50%.
5. This race-based approach proved more accurate at identifying patterns and predicting results in elections.
6. For individuals who previously voted in seats with 3-corner fights between PR component parties, all PR votes were treated as one party. If the result was 60% BN, 20% PAS and 20% DAP then the base probability for voters in that lane would be 60% BN and 20% PR.
7. For seats where BN did not contest and it was a contest between PR and Independents, Independent results were treated as pro-BN results.
8. Any voter whose level of support cannot be determined is assigned a probability of 50% on voting BN/Opposition and categorised as a fence-sitter.
9. Voting preferences and turnout rates for new voters are calculated based on averages from their peers – individuals with similar characteristics (age, race, location) in the electoral roll.

By calculating support and swing levels at the individual level we can address the impact of voter migration between seats; voters who have passed away; and new voters registered to vote since GE13.

Because individual voters have their own support and swing statistics, we can calculate the proportion of the electorate that is leaning towards Opposition (>50% probability of voting Opposition); leaning towards BN (<50% probability of voting Opposition); and on the fence (50% probability of voting Opposition). Voters who are leaning BN might still vote Opposition, so this metric is only an indicator of how good the odds are for the Opposition/BN to win support from the electorate.

To see previous applications of this method please read our previous reports at the following links:

- Election Forecast for Pakatan Harapan in Peninsular Malaysia
(<https://politweet.wordpress.com/2018/01/16/election-forecast-for-pakatan-harapan-in-peninsular-malaysia-ge14/>)
- The Impact of Redelineation on The Selangor State Elections
(<https://politweet.wordpress.com/2016/11/09/the-impact-of-redelineation-on-the-selangor-state-elections/>)
- How Barisan Nasional and Pakatan Rakyat Performed with Voters in Sarawak (GE13)
(<https://politweet.wordpress.com/2016/04/16/how-barisan-nasional-and-pakatan-rakyat-performed-with-voters-in-sarawak-ge13/>)
- Analysing Pakatan Rakyat's Performance with Malay Voters in Peninsular Malaysia (GE13)
(<https://politweet.wordpress.com/2015/07/27/analysing-pakatan-rakys-performance-with-malay-voters-in-peninsular-malaysia-ge13/>)
- Urban Development Categorisation of Parliament Seats in Malaysia
(<https://politweet.wordpress.com/2013/05/30/urban-development-categorisation-of-parliament-seats-in-malaysia/>)

How Our Method Applies to State Elections

Our probabilities are calculated based on General Election results at the Federal level. They are not accurate at the State level in seats that exhibited split voting (where voters chose different coalitions at Federal and State level). Split voting was not significant enough to have overturned the winning majorities at the Federal level.

4. Overview of Johor Election Statistics

Total seats: 56

Total voters: 1,774,055

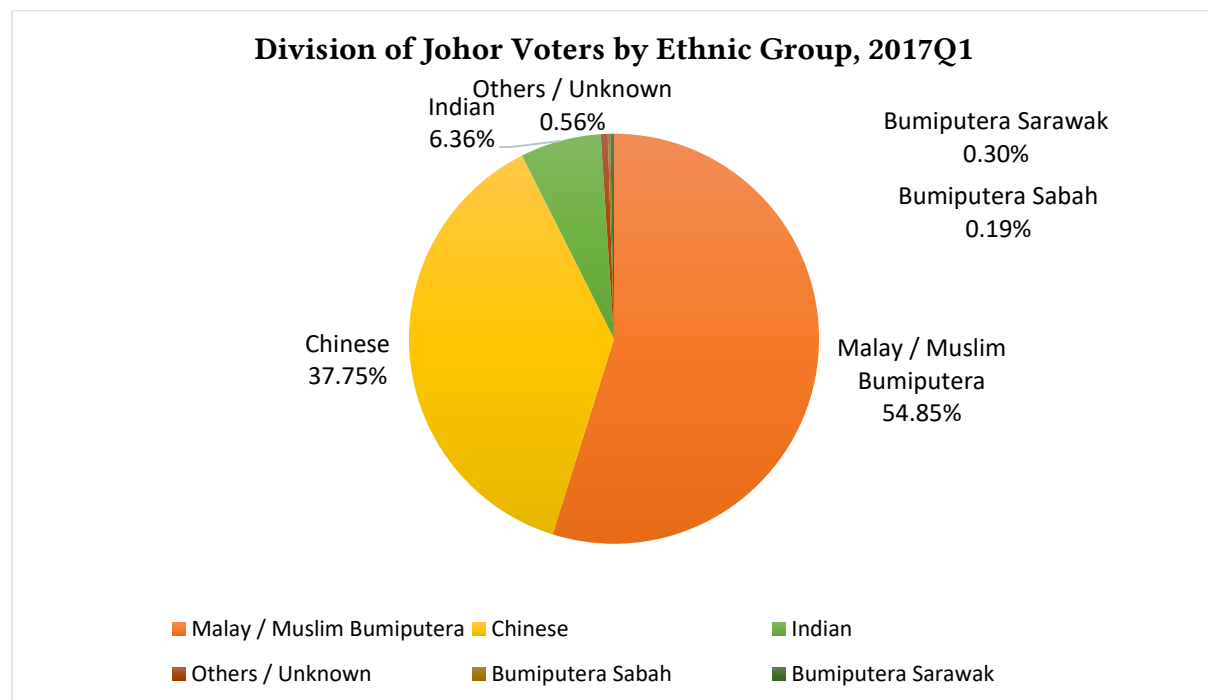
Net increase in voters: 168,744

New voters (since GE13): 235,733

Removed voters (since GE13): 66,989

Transferred-in voters (who voted in other states in GE13): 17,913

The division of voters by ethnic group is shown in the chart below.



Division of Seats Won by Each Party in GE13

In GE13 PR won 89 seats while BN won 133 seats. In Peninsular Malaysia PR won 80 seats while BN won 85 seats.

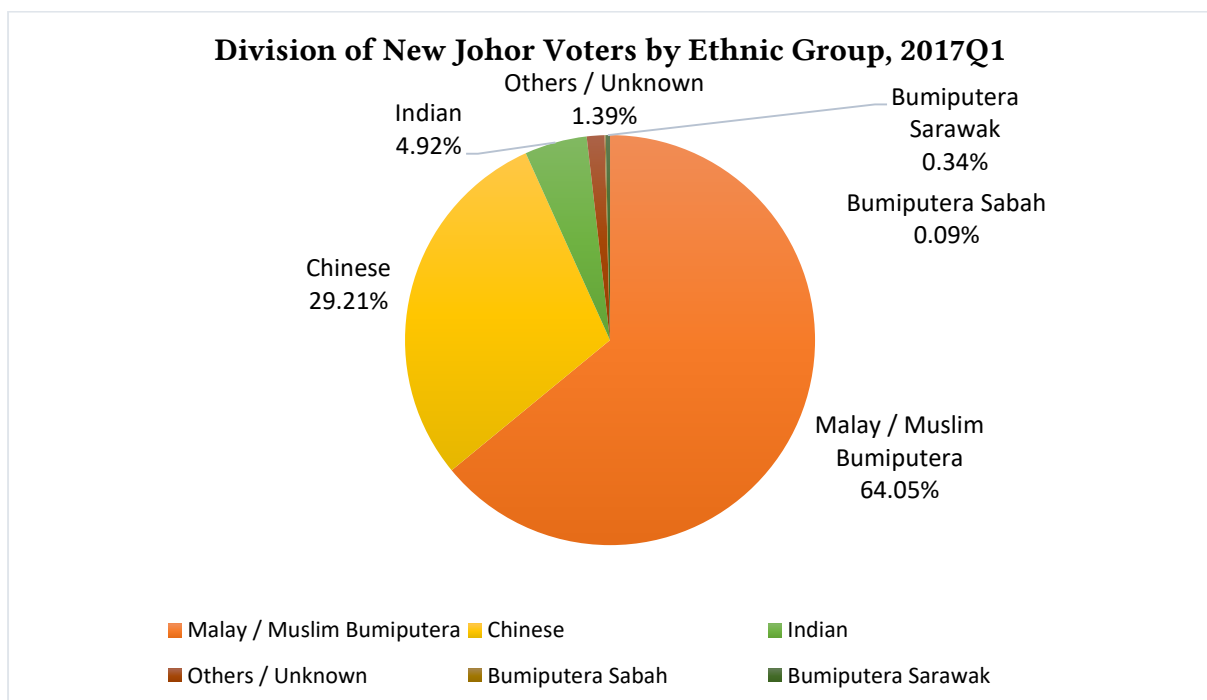
Party	Contested	Won
BN	165	85
PKR	64	28
DAP	36	31
PAS	65	21

The breakdown of seats won by urban development category is shown in the table below:

Urban Development Category / Party	DAP	PKR	PAS	BN	Total
Rural	2	2	11	66	81
Semi-Urban	10	14	6	14	44
Urban	19	12	4	5	40

New Voters

The division of voters by estimated ethnic group is shown in the chart below.

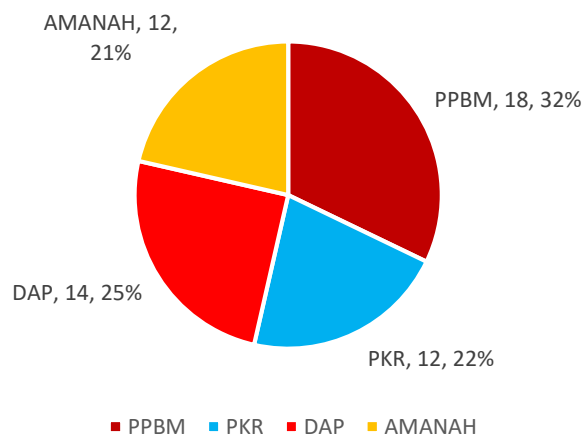


5. Overview of GE14 Contested Seats

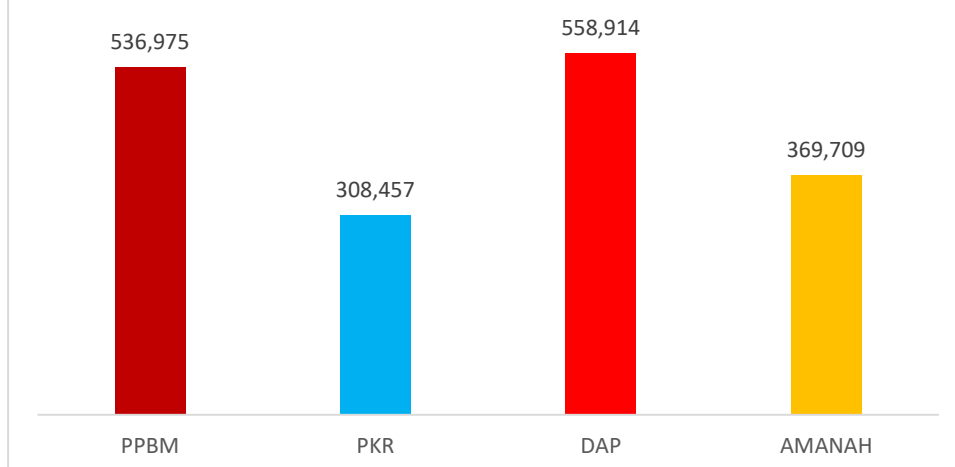
The number of seats contested by each component party of PH is listed below.

Party	GE14	Voters (2017Q1)
PPBM	18	536,975
PKR	12	308,457
DAP	14	558,914
AMANAH	12	369,709

Distribution of PH-Contested Seats by Party,
Johor State Elections, GE14

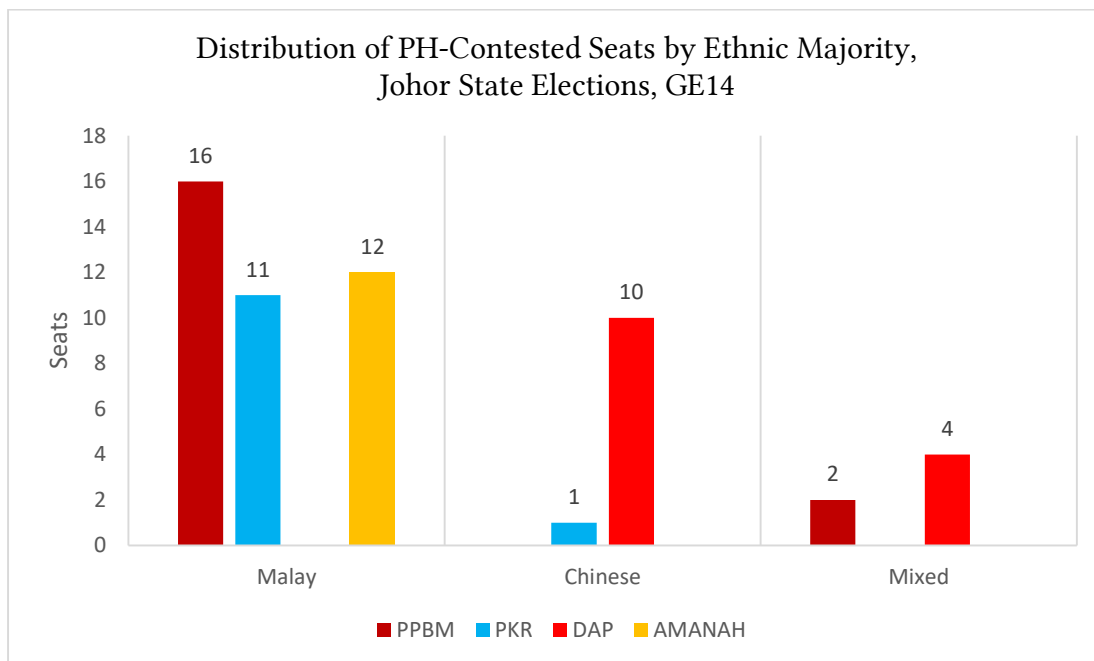


Number of Voters in PH-Contested Seats,
Johor State Elections, GE14



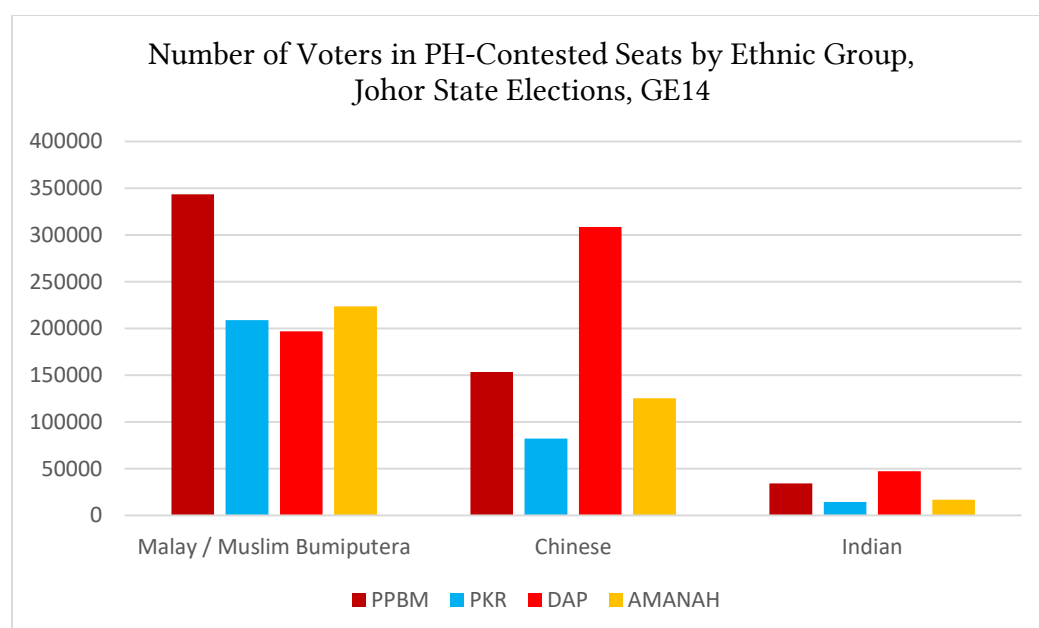
The breakdown of seats contested by ethnic majority is shown in the table below:

Ethnic Majority	Seats	PPBM	PKR	DAP	AMANAH
Malay	39	16	11	0	12
Chinese	11	0	1	10	0
Mixed	6	2	0	4	0
Total	56	18	12	14	12

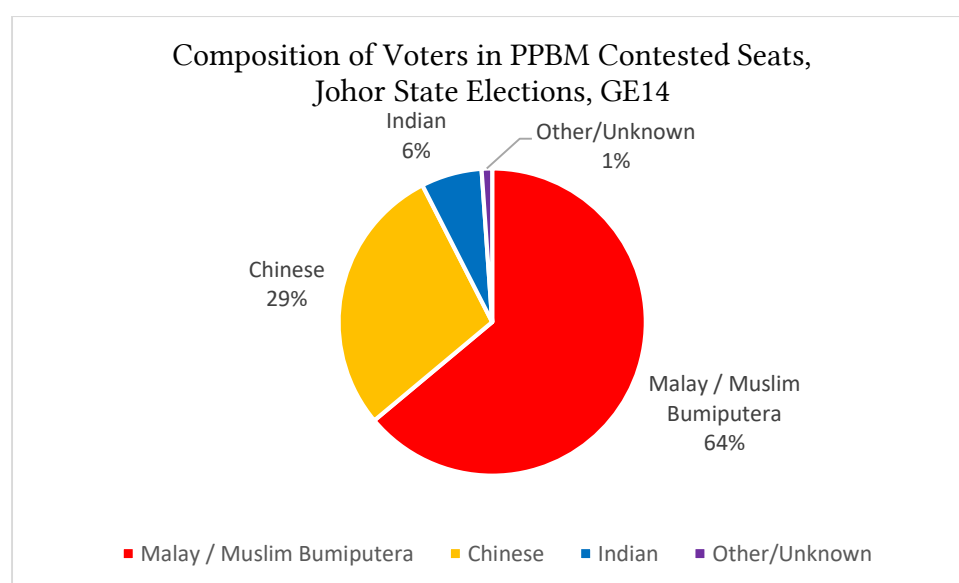


The breakdown of voters in contested seats by ethnic group is shown in the table below:

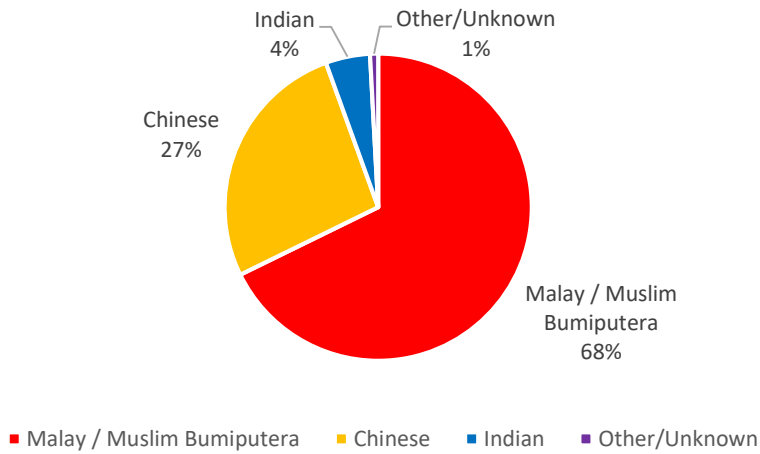
Ethnic Group	PPBM	PKR	DAP	AMANAH
Malay / Muslim Bumiputera	343,298	208,990	197,016	223,714
Chinese	153,355	82,408	308,552	125,314
Indian	34,372	14,420	47,306	16,806
Other/Unknown	5,950	2,639	6,040	3,875
Total	536,975	308,457	558,914	369,709



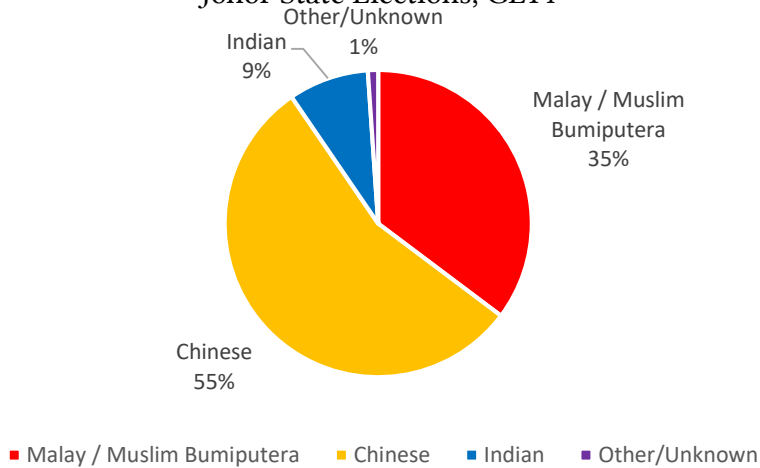
The composition of voters in contested seats by ethnic group on a party basis is shown in the following charts.



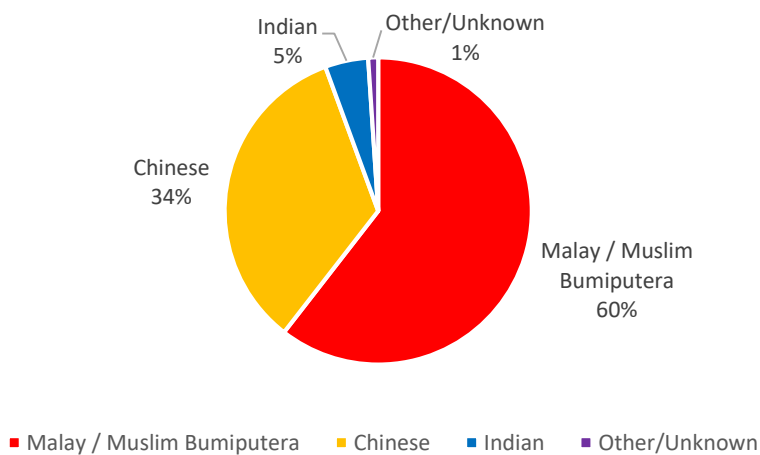
Composition of Voters in PKR Contested Seats,
Johor State Elections, GE14



Composition of Voters in DAP Contested Seats,
Johor State Elections, GE14



Composition of Voters in AMANAH Contested Seats,
Johor State Elections, GE14

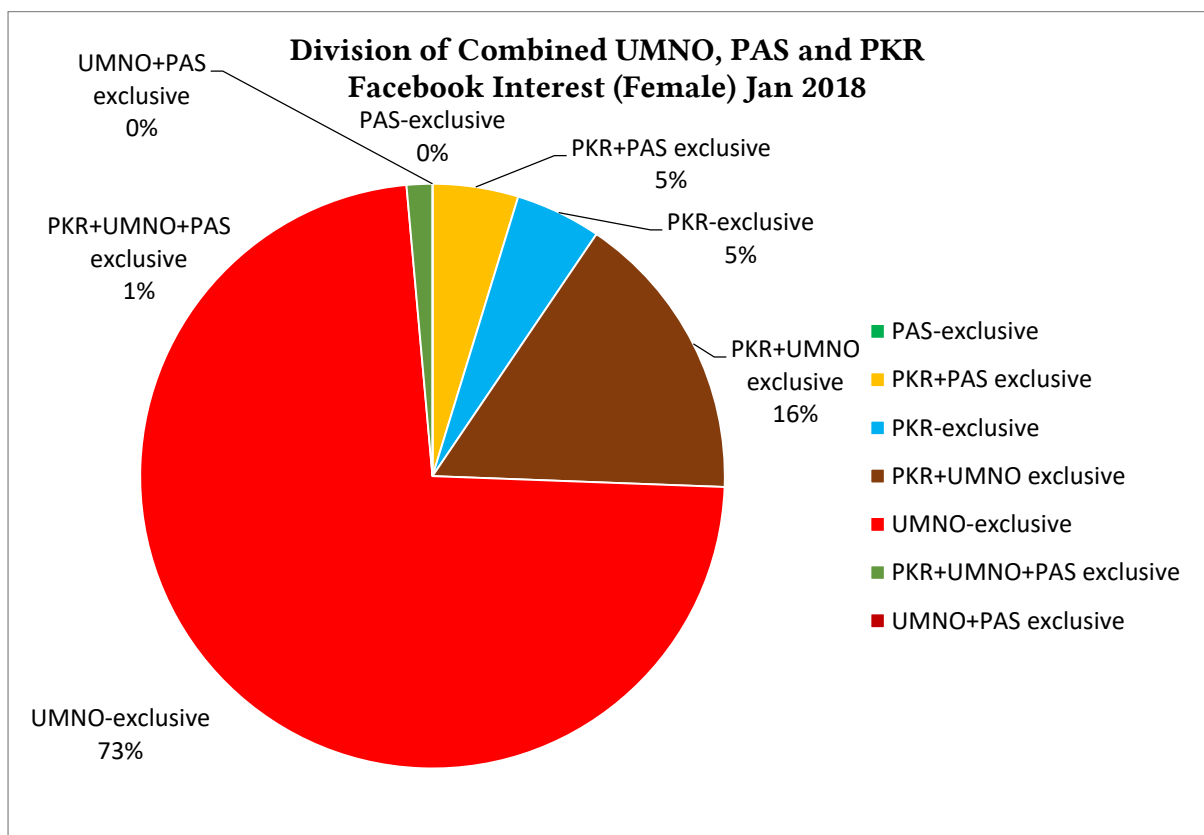
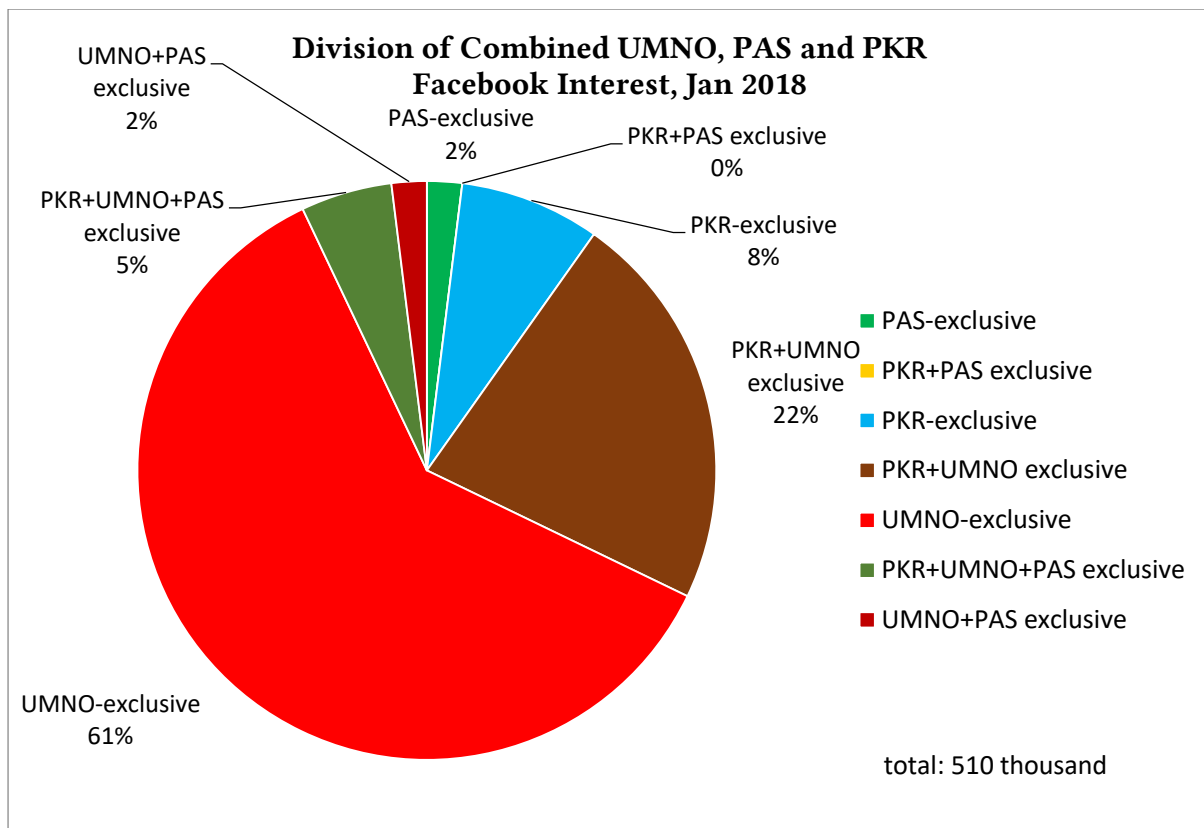


6. Political Facebook Interest in Johor

The table below shows the number of Facebook users interested in major political parties in Johor, aged 21 years and above. This is calculated based on their profile information, Page likes, posts, shares and other activity on Facebook. The number of users is considered to be the 'audience' or user-base for each party/politician. For comparison we have included Tun Mahathir and PM Najib. One common pattern is that DAP, PKR and PAS all have a user-base that is >70% male.

Party/Politician	Total	Male	Female	Male (%)	Female (%)
UMNO	460,000	270,000	190,000	58.70	41.30
DAP	160,000	120,000	48,000	75.00	25.00
PKR	180,000	130,000	49,000	72.22	27.78
PAS	46,000	33,000	12,000	71.74	28.26
Tun Mahathir	180,000	120,000	57,000	66.67	33.33
PM Najib	460,000	280,000	180,000	60.87	39.13

The following charts show how interest in UMNO, PKR and PAS is divided among users aged 21 years and above residing in Johor. This allows us to measure the size of overlapping audiences between parties, for every combination. Exclusive interest in a party or combination of parties means those users do not show exclusive interest in the other parties and combinations of parties.

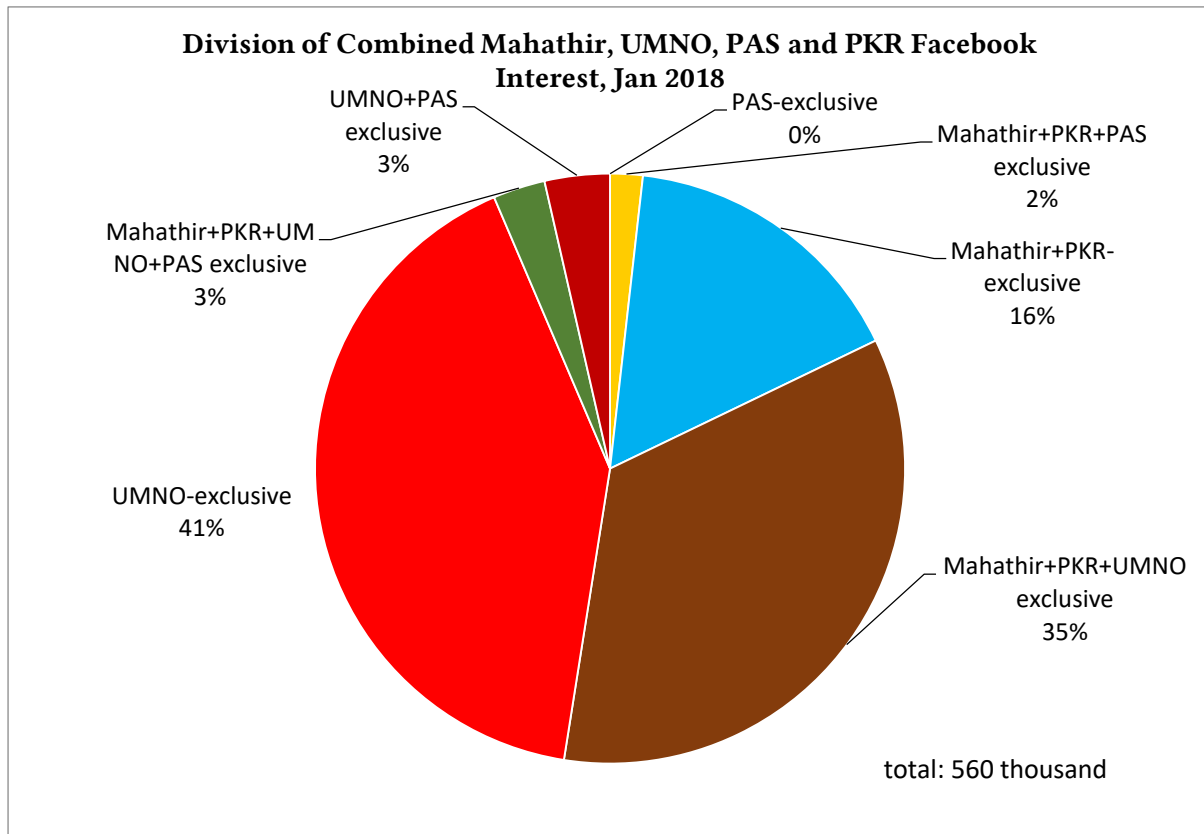


We calculated these figures to get a sense of how interest is divided between parties with the best appeal to the Malay electorate. From these charts we can observe that PAS has little influence in

Johor on Facebook and UMNO dominates both in terms of conversation and Page likes. Women also have very little interest in PKR and PAS.

Facebook currently does not make statistics for PPBM or AMANAH available. This is usually an indicator that interest is too low. However we can test for Tun Mahathir's reach for users in Johor.

If we combine interest in Tun Mahathir with PKR and measure the divide, UMNO still retains the largest exclusive share in Johor.



Compared to the previous chart, PAS' exclusive share is 0% because all of those users were interested in Tun Mahathir.

Out of the 460 thousand users in Johor who are interested in UMNO, PKR on its own can reach 30.4%. PKR and Tun Mahathir combined can reach 45.7%. This still leaves 250 thousand potential Johor voters on Facebook who are only interested in UMNO.

Another issue that should concern both BN and Opposition parties is that only 25.45% of the total 2.2 million potential voters in Johor on Facebook have interest in UMNO, PKR, PAS or Tun Mahathir. Both sides will have issues campaigning on Facebook though UMNO will have the advantage of a larger base of users and a greater proportion of women in its audience.

7. Using Average Support Values to Estimate Winning Odds

For each voter we have calculated the odds of them voting for Opposition or BN as a percentage between 0% – 100%. To simulate an election, we would take all the individual voters for a given constituency and run them through a process to get detailed election results for each seat.

However in this case we are only looking at the basic odds of winning the seat in a straight fight. To do this we calculated the average the average support for BN and the Opposition. This is calculated as the sum of probabilities of individuals voting BN / Opposition for each seat divided by the number of voters. This gives us the 'Average Odds of Voting Opposition' that we can use to work out the number of winning seats.

From our experience running simulations at the Federal level:

- Any seat with an average support of 52% and above is a safe seat
- Seats with an average support value of 49% and above is winnable though the margin would be very slim if it is below 51%
- Seats with an average support value below 49% would require a minimum swing in support for PH to win:
 - 47% to <49% would require a +2 point swing to PH
 - 44% to <47% would require a +5 point swing to PH
 - 40% to <44% would require a +10 point swing to PH

Between 2013 and 2017Q1, the seat demographics have changed due to new voter registrations, deleted voters and voters transferred in or out. This has shifted the odds towards or away from the Opposition.

The most significant changes in averaged support levels for the Opposition occurred in the following seats:

- Support has dropped by 2.97 points in N12.BENTAYAN (won by DAP in GE13). DAP is still expected to win in GE14 as the average support value of BENTAYAN is 63%
- Support has dropped by 2.84 points in N3.PEMANIS (won by BN in GE13). PKR will have a challenge winning the seat as the average support value is now 43%
- Support has increased by 1.11 points in N46.PENGKALAN RINTING (won by DAP in GE13). It is still not a safe seat as the support level is now 50.81%
- Support has increased by 1.74 points in N50. BUKIT PERMAI (won by BN in GE13). It remains a challenging seat for PPBM as the average support value is now 41.6%
- Support has increased by 2.67 points in N56. KUKUP (won by BN in GE13). It remains a very challenging seat for AMANAH as the average support value is now 31%

8. Evaluating Winning Scenarios for PH

We used the average support values for each seat to evaluate the odds of PH winning under the following conditions for 4 scenarios:

- Straight fights between BN and a united Opposition
- PAS was not included, any support for PAS is assumed to be 'pro-Opposition' support
- No redelineation
- Voter sentiment unchanged since GE13
- Average voter turnout rate based on GE13
- Because we are using averaged support levels, only the best-case scenario results were calculated. This includes seats won with slim majorities

The 4 scenarios tested were:

- Scenario 1: Voter sentiment unchanged since GE13
- Scenario 2: +2 point increase in support for the Opposition i.e. a voter with a 48% probability of voting Opposition would now have a 50% probability of voting Opposition
- Scenario 3: +5 point increase in support for the Opposition
- Scenario 4: +10 point increase in support for the Opposition

29 seats are needed to win control of the state government. The full results are listed in **Appendix 2** (page 22). A summary of the results is in the table below:

Party	Scenario 1: GE13 Odds	Scenario 2: PH +2pts	Scenario 3: PH +5pts	Scenario 4: PH +10pts
BN	38	37	29	20
PH	18	19	27	36

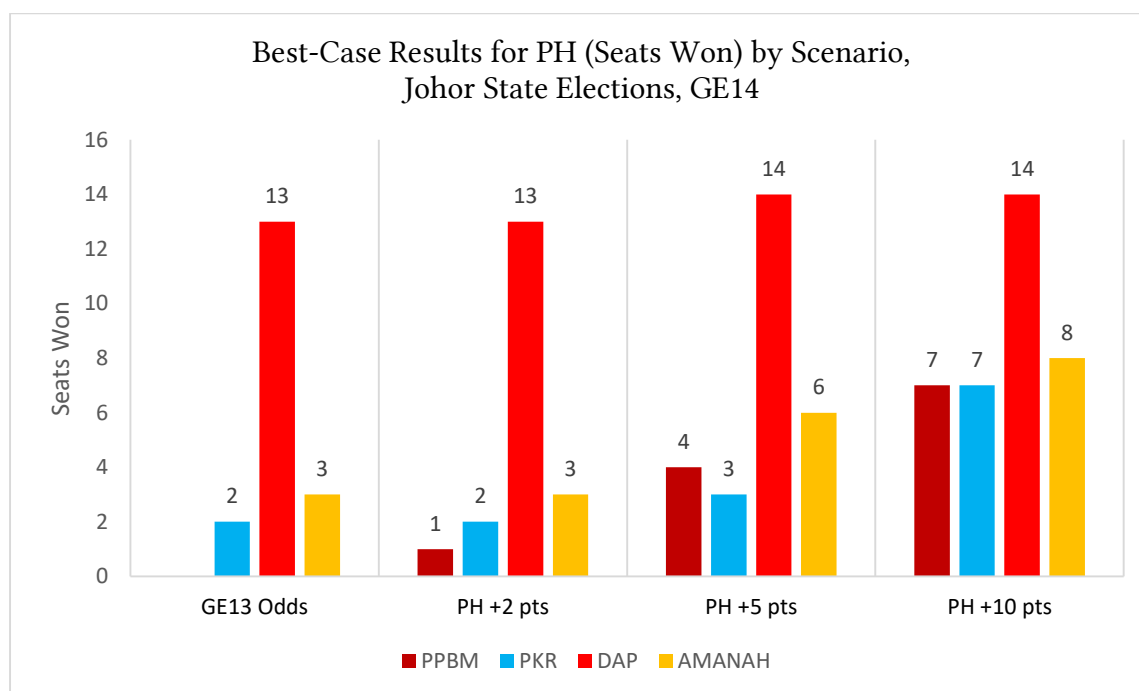
Division of seats won by party

The table below shows the range of seats won by each party for each scenario.

Party	Contested Seats	Scenario 1: GE13 Odds	Scenario 2: PH +2pts	Scenario 3: PH +5pts	Scenario 4: PH +10pts
PPBM	18	0	1	4	7
PKR	12	2	2	3	7
DAP	14	13	13	14	14
AMANAH	12	3	3	6	8

(seats won = maximum possible seats won)

9. Conclusion



In a straight fight against BN, PH can form the state government with a 10-point swing of support leading to a win of 36 seats.

3-corner fights between PH, PAS and BN would most likely benefit BN. The only way for PH to overcome this is for their parties to win over pro-BN supporters.

For example in a seat contested by PAS, PPBM and BN, if 10% of the anti-BN vote went to PAS, PPBM would need to counter that by getting >10% of the pro-BN vote. If PH is able to do this in 3-corner fights then the results of Scenario 4 (a 10-point swing to PH) can be achieved.

Getting Malay voters to switch from BN to PH will be challenging. From our observations on Twitter since 2015, young Malays (aged 21-30 years) in Johor are more likely to express support for UMNO compared to young Malays in other states.

To summarise:

- PPBM and PKR are contesting the most difficult seats to win a straight fight
- The impact of PAS contesting against PH in 3-corner fights needs to be overcome by PH winning votes from pro-BN voters
- Our estimates on the number of seats won are 'best-case' scenarios based on a simple formula instead of election simulations. Simulations would be more accurate and reliable.
- PH likely needs to target more than a 10-point swing to win Johor in addition to neutralising the effect of PAS by winning over pro-BN voters
- UMNO has a large share of exclusive interest on Facebook, making it more difficult for PH and Tun Mahathir to spread their message
- UMNO and PM Najib draw more interest from women compared to the Opposition parties and Tun Mahathir

10. Appendix 1: Johor State Seat Details

The table below lists the statistics and classification for each state seat (DUN).

Parliament Seat Code	Parliament	State Seat Code	Dun Name	Voters (2017Q1)	Majority Ethnic Group	Malay (%)	Chinese (%)	Indian (%)	GE13 Winner	GE14 PH Contesting Party	Avg (Odds of Voting for Opposition)
140	SEGAMAT	1	BULOH KASAP	20941	MALAY	56.78	30.35	12.42	BN	PPBM	38.22
140	SEGAMAT	2	JEMENTAH	32086	CHINESE	37.90	53.27	8.29	DAP	DAP	55.04
141	SEKIJANG	3	PEMANIS	21939	MALAY	63.04	33.55	3.05	BN	PKR	43.24
141	SEKIJANG	4	KEMELAH	22728	MALAY	55.62	38.53	5.22	BN	AMANAH	45.56
142	LABIS	5	TENANG	19048	MIXED	49.11	38.81	10.60	BN	PPBM	44.23
142	LABIS	6	BEKOK	20790	CHINESE	28.52	51.33	17.70	DAP	DAP	53.02
143	PAGOH	7	BUKIT SERAMPANG	22399	MALAY	72.52	24.80	1.84	BN	PPBM	27.99
143	PAGOH	8	JORAK	27186	MALAY	60.99	33.50	5.24	BN	PPBM	39.56
144	LEDANG	9	GAMBIR	23152	MALAY	59.03	37.19	3.50	BN	PPBM	44.08
144	LEDANG	10	TANGKAK	25646	MIXED	40.39	49.20	9.20	DAP	DAP	55.37
144	LEDANG	11	SEROM	26874	MALAY	67.86	30.98	0.85	BN	AMANAH	43.14
145	BAKRI	12	BENTAYAN	30217	CHINESE	29.80	67.61	2.13	DAP	DAP	63.08

Parliament Seat Code	Parliament	State Seat Code	Dun Name	Voters (2017Q1)	Majority Ethnic Group	Malay (%)	Chinese (%)	Indian (%)	GE13 Winner	GE14 PH Contesting Party	Avg (Odds of Voting for Opposition)
145	BAKRI	13	SUNGAI ABONG	24136	MALAY	51.82	44.61	2.78	PAS	AMANAHA	51.09
145	BAKRI	14	BUKIT NANING	17720	MALAY	61.90	36.50	1.06	BN	PKR	41.40
146	MUAR	15	MAHARANI	29231	MALAY	56.58	40.50	2.25	PAS	AMANAHA	52.66
146	MUAR	16	SUNGAI BALANG	22395	MALAY	73.32	26.27	0.18	BN	PKR	41.42
147	PARIT SULONG	17	SEMERAH	31379	MALAY	67.20	31.85	0.64	BN	PKR	45.02
147	PARIT SULONG	18	SRI MEDAN	27935	MALAY	90.15	9.28	0.32	BN	PPBM	29.49
148	AYER HITAM	19	YONG PENG	24402	CHINESE	33.54	59.59	6.50	DAP	DAP	52.88
148	AYER HITAM	20	SEMARANG	21712	MALAY	85.16	13.76	0.85	BN	PPBM	26.50
149	SRI GADING	21	PARIT YAANI	26899	MALAY	55.31	43.30	0.98	PAS	AMANAHA	49.57
149	SRI GADING	22	PARIT RAJA	22986	MALAY	76.56	21.58	1.57	BN	PPBM	35.30
150	BATU PAHAT	23	PENGGARAM	48599	CHINESE	37.13	60.02	2.21	DAP	DAP	61.66
150	BATU PAHAT	24	SENGGARANG	26978	MALAY	64.31	34.76	0.54	BN	AMANAHA	42.41

Parliament Seat Code	Parliament	State Seat Code	Dun Name	Voters (2017Q1)	Majority Ethnic Group	Malay (%)	Chinese (%)	Indian (%)	GE13 Winner	GE14 PH Contesting Party	Avg (Odds of Voting for Opposition)
150	BATU PAHAT	25	RENGIT	20837	MALAY	82.78	16.67	0.25	BN	PKR	33.05
151	SIMPANG RENGGAM	26	MACHAP	23622	MALAY	65.36	29.32	4.94	BN	PPBM	40.11
151	SIMPANG RENGGAM	27	LAYANG-LAYANG	19267	MALAY	52.73	32.76	13.89	BN	PKR	41.92
152	KLUANG	28	MENGKIBOL	44807	CHINESE	28.47	57.96	13.10	DAP	DAP	61.40
152	KLUANG	29	MAHKOTA	50473	MALAY	52.94	39.06	5.75	BN	AMANAH	46.48
153	SEMBRONG	30	PALOH	18657	MIXED	39.56	42.32	16.85	BN	DAP	46.94
153	SEMBRONG	31	KAHANG	24852	MALAY	76.13	19.85	2.57	BN	PPBM	26.71
154	MERSING	32	ENDAU	20550	MALAY	77.76	17.88	0.94	BN	PPBM	39.02
154	MERSING	33	TENGGAROH	27332	MALAY	83.89	12.04	1.60	BN	PKR	21.94
155	TENGGARA	34	PANTI	18757	MALAY	89.01	6.20	3.42	BN	PPBM	17.46
155	TENGGARA	35	PASIR RAJA	24973	MALAY	64.44	23.71	8.69	BN	AMANAH	32.85
156	KOTA TINGGI	36	SEDILI	27708	MALAY	97.21	1.75	0.71	BN	PKR	9.51
156	KOTA TINGGI	37	JOHOR LAMA	18498	MALAY	74.72	21.22	3.62	BN	PKR	26.92

Parliament Seat Code	Parliament	State Seat Code	Dun Name	Voters (2017Q1)	Majority Ethnic Group	Malay (%)	Chinese (%)	Indian (%)	GE13 Winner	GE14 PH Contesting Party	Avg (Odds of Voting for Opposition)
157	PENGERANG	38	PENAWAR	21148	MALAY	98.39	0.34	0.76	BN	AMANAHAH	10.29
157	PENGERANG	39	TANJONG SURAT	18478	MALAY	79.36	19.21	0.77	BN	PKR	18.76
158	TEBRAU	40	TIRAM	57917	MALAY	56.82	28.67	12.76	BN	PKR	56.30
158	TEBRAU	41	PUTERI WANGSA	58973	MIXED	38.82	49.84	10.31	PAS	PPBM	48.46
159	PASIR GUDANG	42	JOHOR JAYA	59379	MIXED	43.68	46.68	7.13	DAP	DAP	51.53
159	PASIR GUDANG	43	PERMAS	60304	MALAY	55.90	27.23	13.51	BN	PPBM	45.22
160	JOHOR BAHRU	44	TANJONG PUTERI	53704	MALAY	63.78	30.17	5.27	BN	PPBM	37.28
160	JOHOR BAHRU	45	STULANG	45592	CHINESE	39.90	54.55	4.47	DAP	DAP	50.90
161	PULAI	46	PENGKALAN RINTING	69873	MIXED	42.24	45.33	10.93	DAP	DAP	50.81
161	PULAI	47	KEMPAS	42573	MALAY	56.72	33.42	8.94	BN	PPBM	42.84
162	GELANG PATAH	48	SKUDAI	61545	CHINESE	23.30	64.07	11.75	DAP	DAP	64.93
162	GELANG PATAH	49	NUSA JAYA	65494	MALAY	51.68	35.19	11.90	BN	AMANAHAH	46.11

Parliament Seat Code	Parliament	State Seat Code	Dun Name	Voters (2017Q1)	Majority Ethnic Group	Malay (%)	Chinese (%)	Indian (%)	GE13 Winner	GE14 PH Contesting Party	Avg (Odds of Voting for Opposition)
163	KULAI	50	BUKIT PERMAI	25614	MALAY	53.38	34.59	11.42	BN	PPBM	41.61
163	KULAI	51	BUKIT BATU	24987	CHINESE	32.10	60.28	7.03	PKR	PKR	60.83
163	KULAI	52	SENAI	43199	CHINESE	24.65	63.55	11.01	DAP	DAP	64.41
164	PONTIAN	53	BENUT	22667	MALAY	81.96	17.64	0.17	BN	PPBM	28.28
164	PONTIAN	54	PULAI SEBATANG	28260	MALAY	65.22	32.98	1.41	BN	AMANAH	37.60
165	TANJONG PIAI	55	PEKAN NENAS	34122	CHINESE	42.68	55.74	1.15	DAP	DAP	51.75
165	TANJONG PIAI	56	KUKUP	22515	MALAY	69.58	28.99	1.02	BN	AMANAH	31.18

11. Appendix 2: Winning Scenario Results

The table below lists the seats won by each party based on the scenarios given. If it is possible for a seat to be won under a scenario, 'YES' will be stated in the corresponding column. Please bear in mind that these are best-case estimates, with no indication of the size of the winning majority.

Parliament Seat Code	Parliament	State Seat Code	DUN	GE13 Winner	GE14 PH Contesting Party	Avg (Odds of Voting for Opposition	S1: GE13 Odds	S2: PR +2pt Swing	S3: PR +5pt Swing	S4: PR +10pt Swing
140	SEGAMAT	1	BULOH KASAP	BN	PPBM	38.22				
140	SEGAMAT	2	JEMENTAH	DAP	DAP	55.04	YES	YES	YES	YES
141	SEKIJANG	3	PEMANIS	BN	PKR	43.24				YES
141	SEKIJANG	4	KEMELAH	BN	AMANAHAH	45.56			YES	YES
142	LABIS	5	TENANG	BN	PPBM	44.23			YES	YES
142	LABIS	6	BEKOK	DAP	DAP	53.02	YES	YES	YES	YES
143	PAGOH	7	BUKIT SERAMPANG	BN	PPBM	27.99				
143	PAGOH	8	JORAK	BN	PPBM	39.56				
144	LEDANG	9	GAMBIR	BN	PPBM	44.08			YES	YES
144	LEDANG	10	TANGKAK	DAP	DAP	55.37	YES	YES	YES	YES
144	LEDANG	11	SEROM	BN	AMANAHAH	43.14				YES
145	BAKRI	12	BENTAYAN	DAP	DAP	63.08	YES	YES	YES	YES
145	BAKRI	13	SUNGAI ABONG	PAS	AMANAHAH	51.09	YES	YES	YES	YES
145	BAKRI	14	BUKIT NANING	BN	PKR	41.40				YES

Parliament t Seat Code	Parliament	State Seat Code	DUN	GE13 Winner	GE14 PH Contest g Party	Avg (Odds of Voting for Opposition	S1: GE13 Odds	S2: PR +2pt Swing	S3: PR +5pt Swing	S4: PR +10pt Swing
146	MUAR	15	MAHARANI	PAS	AMANAH	52.66	YES	YES	YES	YES
146	MUAR	16	SUNGAI BALANG	BN	PKR	41.42				YES
147	PARIT SULONG	17	SEMERAH	BN	PKR	45.02			YES	YES
147	PARIT SULONG	18	SRI MEDAN	BN	PPBM	29.49				
148	AYER HITAM	19	YONG PENG	DAP	DAP	52.88	YES	YES	YES	YES
148	AYER HITAM	20	SEMARANG	BN	PPBM	26.50				
149	SRI GADING	21	PARIT YAANI	PAS	AMANAH	49.57	YES	YES	YES	YES
149	SRI GADING	22	PARIT RAJA	BN	PPBM	35.30				
150	BATU PAHAT	23	PENGGARAM	DAP	DAP	61.66	YES	YES	YES	YES
150	BATU PAHAT	24	SENGGARANG	BN	AMANAH	42.41				YES
150	BATU PAHAT	25	RENGIT	BN	PKR	33.05				

Parliament Seat Code	Parliament	State Seat Code	DUN	GE13 Winner	GE14 PH Contesting Party	Avg (Odds of Voting for Opposition)	S1: GE13 Odds	S2: PR +2pt Swing	S3: PR +5pt Swing	S4: PR +10pt Swing
151	SIMPANG RENGAM	26	MACHAP	BN	PPBM	40.11				YES
151	SIMPANG RENGAM	27	LAYANG-LAYANG	BN	PKR	41.92				YES
152	KLUANG	28	MENGKIBOL	DAP	DAP	61.40	YES	YES	YES	YES
152	KLUANG	29	MAHKOTA	BN	AMANAH	46.48			YES	YES
153	SEMBRONG	30	PALOH	BN	DAP	46.94			YES	YES
153	SEMBRONG	31	KAHANG	BN	PPBM	26.71				
154	MERSING	32	ENDAU	BN	PPBM	39.02				
154	MERSING	33	TENGGAROH	BN	PKR	21.94				
155	TENGGARA	34	PANTI	BN	PPBM	17.46				
155	TENGGARA	35	PASIR RAJA	BN	AMANAH	32.85				
156	KOTA TINGGI	36	SEDILI	BN	PKR	9.51				
156	KOTA TINGGI	37	JOHOR LAMA	BN	PKR	26.92				
157	PENGERANG	38	PENAWAR	BN	AMANAH	10.29				

Parliament t Seat Code	Parliament	State Seat Code	DUN	GE13 Winner	GE14 PH Contest g Party	Avg (Odds of Voting for Opposition	S1: GE13 Odds	S2: PR +2pt Swing	S3: PR +5pt Swing	S4: PR +10pt Swing
157	PENGERANG	39	TANJONG SURAT	BN	PKR	18.76				
158	TEBRAU	40	TIRAM	BN	PKR	56.30	YES	YES	YES	YES
158	TEBRAU	41	PUTERI WANGSA	PAS	PPBM	48.46		YES	YES	YES
159	PASIR GUDANG	42	JOHOR JAYA	DAP	DAP	51.53	YES	YES	YES	YES
159	PASIR GUDANG	43	PERMAS	BN	PPBM	45.22			YES	YES
160	JOHOR BAHRU	44	TANJONG PUTERI	BN	PPBM	37.28				
160	JOHOR BAHRU	45	STULANG	DAP	DAP	50.90	YES	YES	YES	YES
161	PULAI	46	PENGKALAN RINTING	DAP	DAP	50.81	YES	YES	YES	YES
161	PULAI	47	KEMPAS	BN	PPBM	42.84				YES
162	GELANG PATAH	48	SKUDAI	DAP	DAP	64.93	YES	YES	YES	YES
162	GELANG PATAH	49	NUSA JAYA	BN	AMANAH	46.11			YES	YES

Parliament Seat Code	Parliament	State Seat Code	DUN	GE13 Winner	GE14 PH Contesting Party	Avg (Odds of Voting for Opposition)	S1: GE13 Odds	S2: PR +2pt Swing	S3: PR +5pt Swing	S4: PR +10pt Swing
163	KULAI	50	BUKIT PERMAI	BN	PPBM	41.61				YES
163	KULAI	51	BUKIT BATU	PKR	PKR	60.83	YES	YES	YES	YES
163	KULAI	52	SENAI	DAP	DAP	64.41	YES	YES	YES	YES
164	PONTIAN	53	BENUT	BN	PPBM	28.28				
164	PONTIAN	54	PULAI SEBATANG	BN	AMANAH	37.60				
165	TANJONG PIAI	55	PEKAN NENAS	DAP	DAP	51.75	YES	YES	YES	YES
165	TANJONG PIAI	56	KUKUP	BN	AMANAH	31.18				