



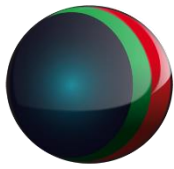
How the voting system changes the elections

patrice.kiener@inmodelia.com

Tel : +33.9.53.45.07.38

Paris + University of Crete – 5 February 2025

Elections in old and modern times

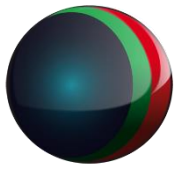


**« Those who vote decide nothing,
those who count the votes decide everything. »**

Joseph Stalin

**Considering the recent elections in Romania,
this sentence is slightly outdated. Let's do it in a more clever way...**

How the voting system changes the elections



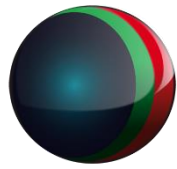
Following the European elections of 9 June 2024,

President Macron decided to dissolve the French national assembly and called for new elections which took place on 30 June 2024 for the first round and on 7 July 2024 for the second round.

It is reasonable to assume that voters have not changed their mind in 3 weeks.

Except that the voting system for the European Parliament and the French parliament are very different and completely change the way of voting of French voters and the results.

This talk is about the voting systems and their impact on the elections.



European Elections, 9 June 2024 in France

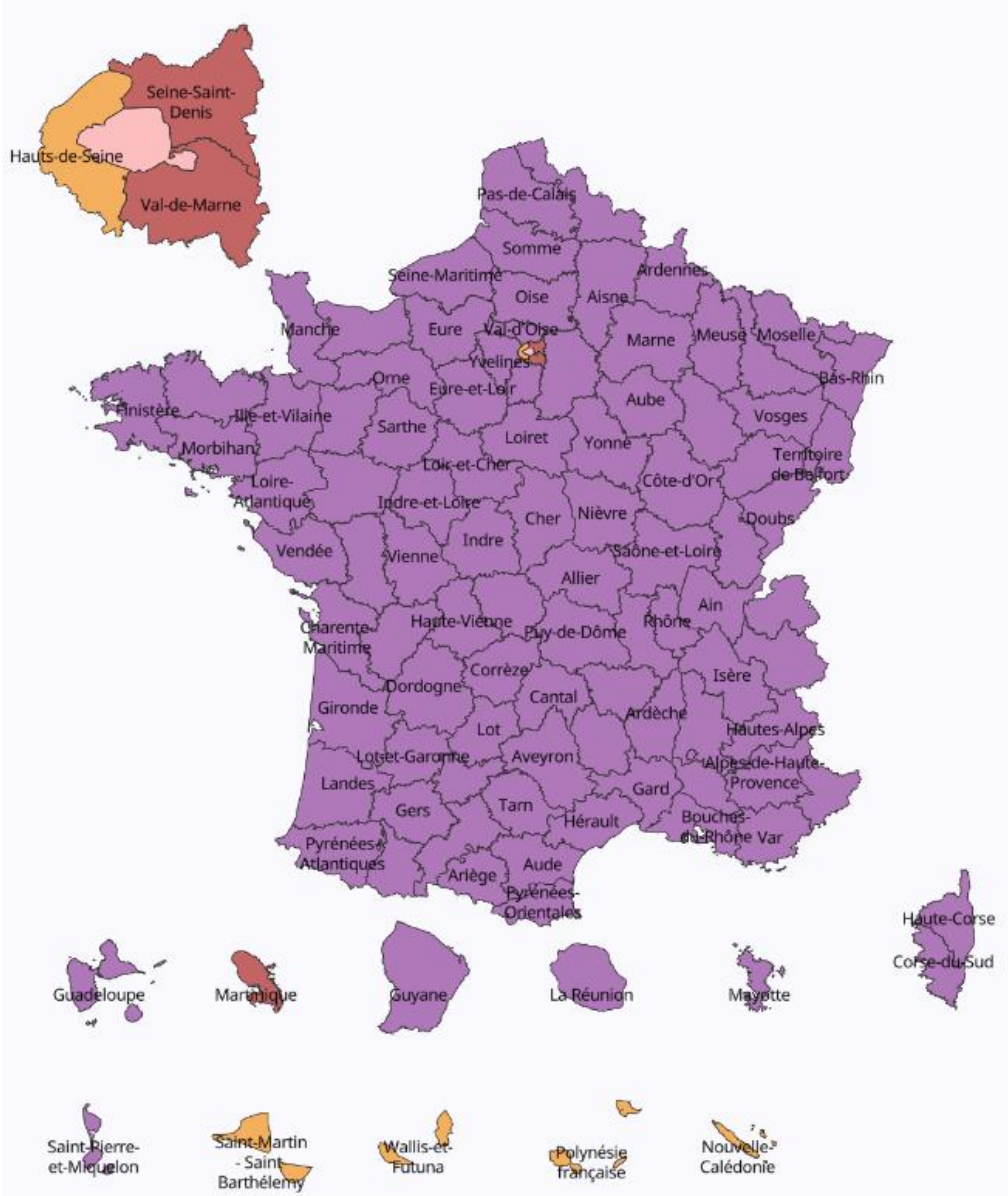
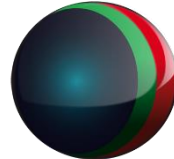


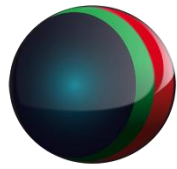
In France, elections are held on Sunday.

Next municipal elections were scheduled in 2026.

Next presidential + parliament elections were scheduled in 2027.

Map of France + 10 overseas departments + T





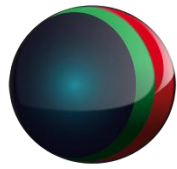
European elections: the voting system

Key points:

- One round
- Lists of candidates at the national level
- Vote is for a list, not for a candidate
- Lists are opened to all citizens
- The cost to create and submit a list is low
- Proportional vote
- 81 seats allocated to France
- One threshold, not $1/81 = 1.23\%$ but 5%

Consequences:

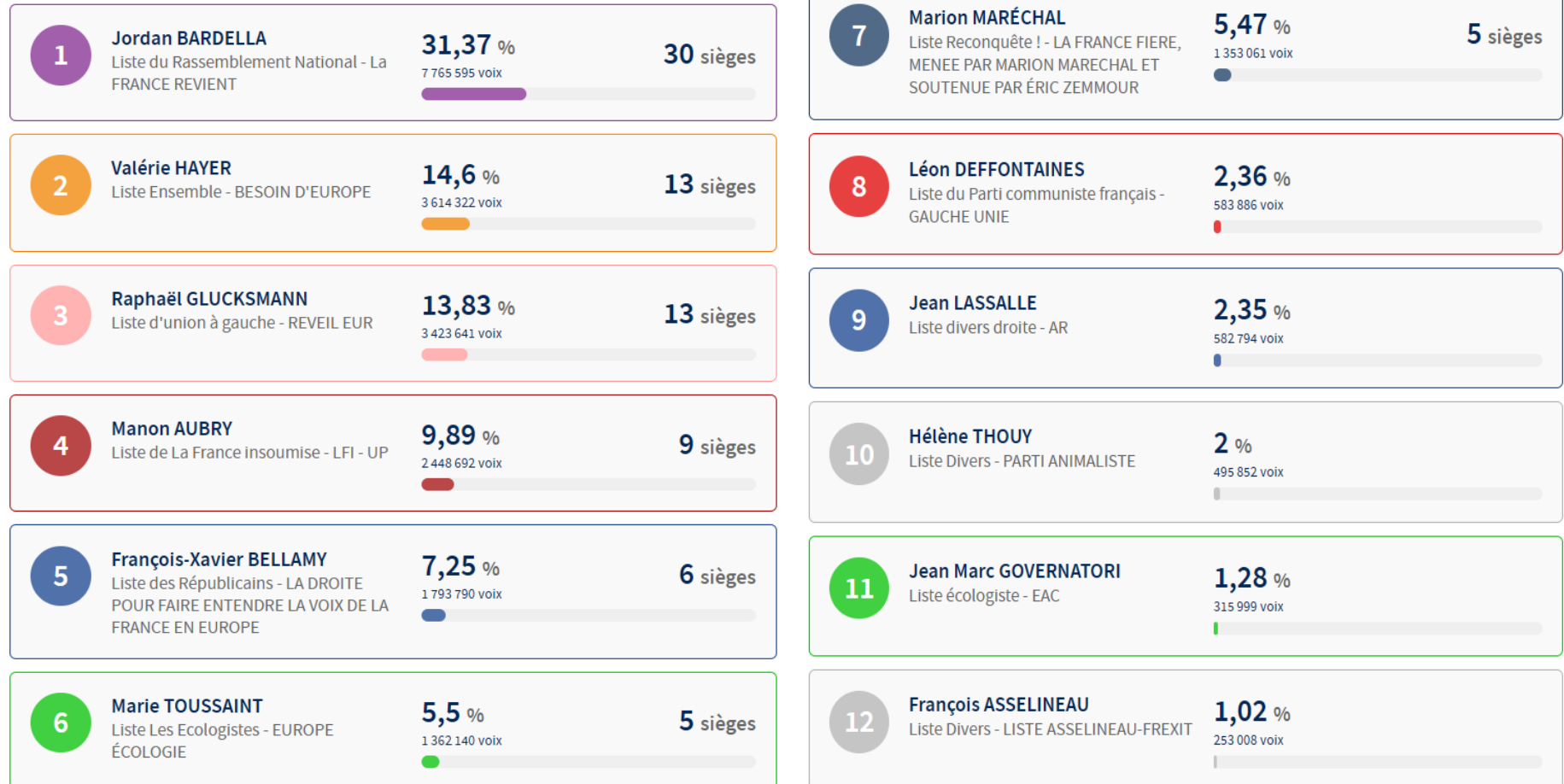
- 38 lists !!!
- Lists having a score between 1.23% and 5% are penalized



European elections: results of lists 1 – 12

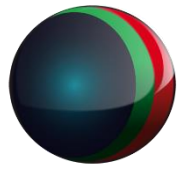
Résultats nationaux

Résultats définitifs : 35270 communes / 35270

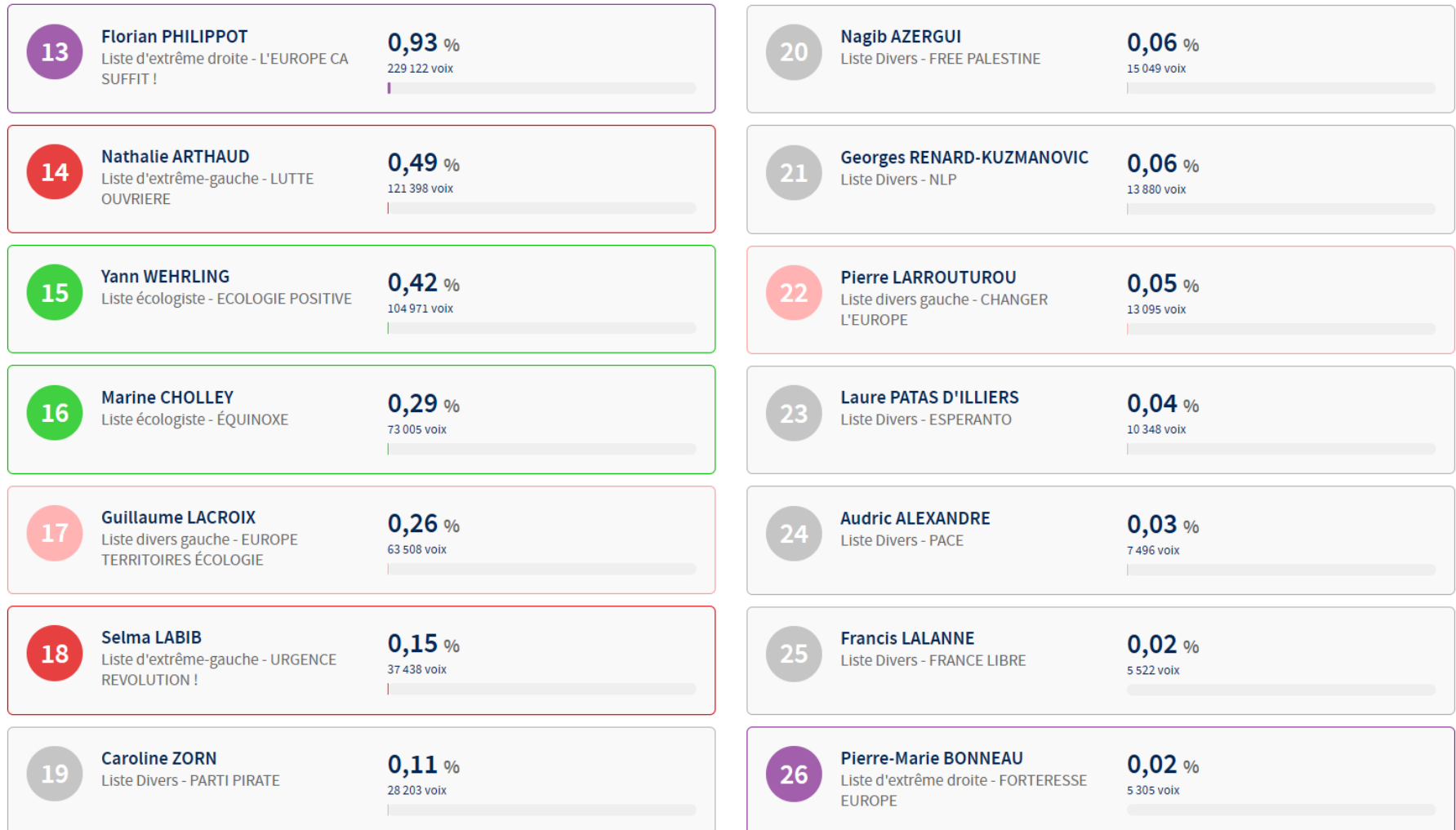


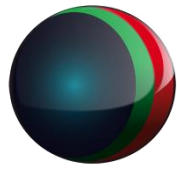
The first seven parties collected 87.91 % of the votes.

Due to the 5 % threshold (rather than 1.23 %), 4 lists (7.99 % of the votes) did not receive a seat.

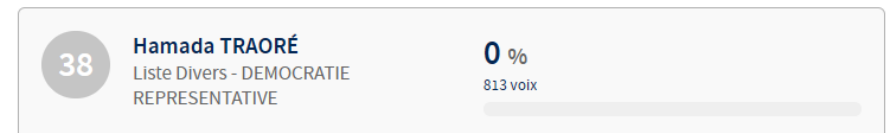
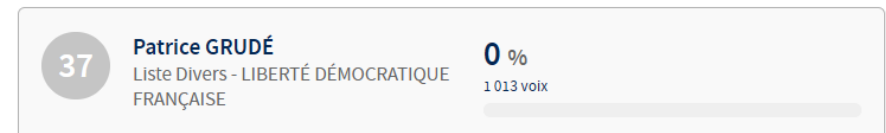
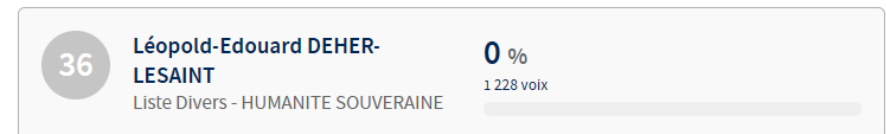
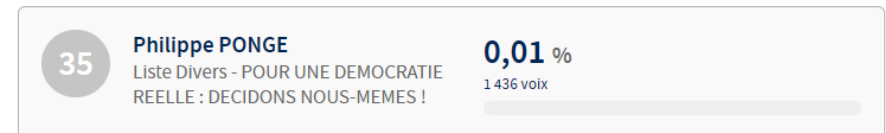
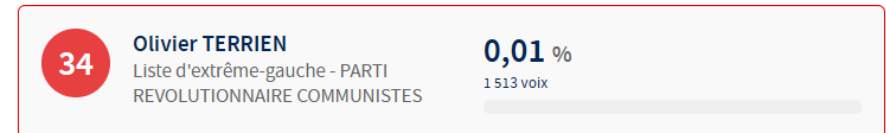
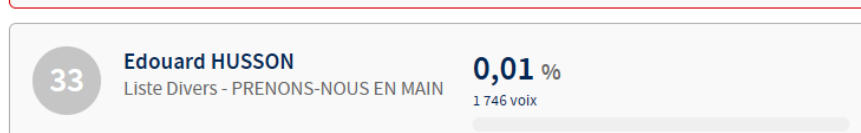
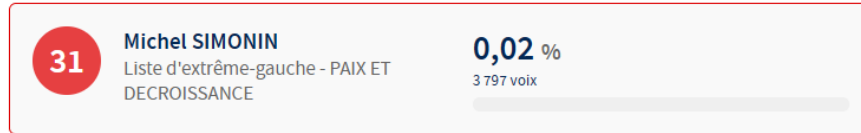
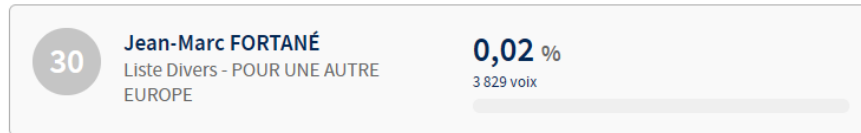
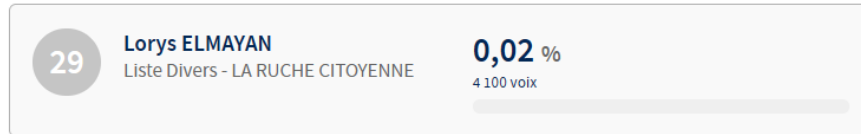
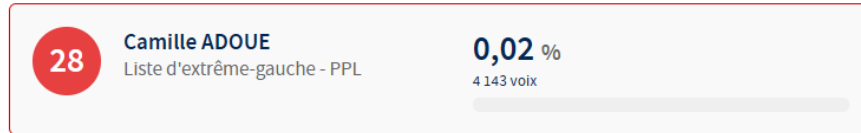
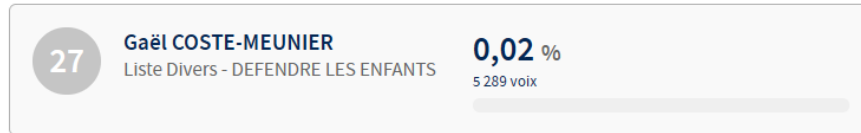


European elections: results of lists 13 – 26



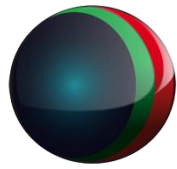


European elections: results of lists 27 – 38



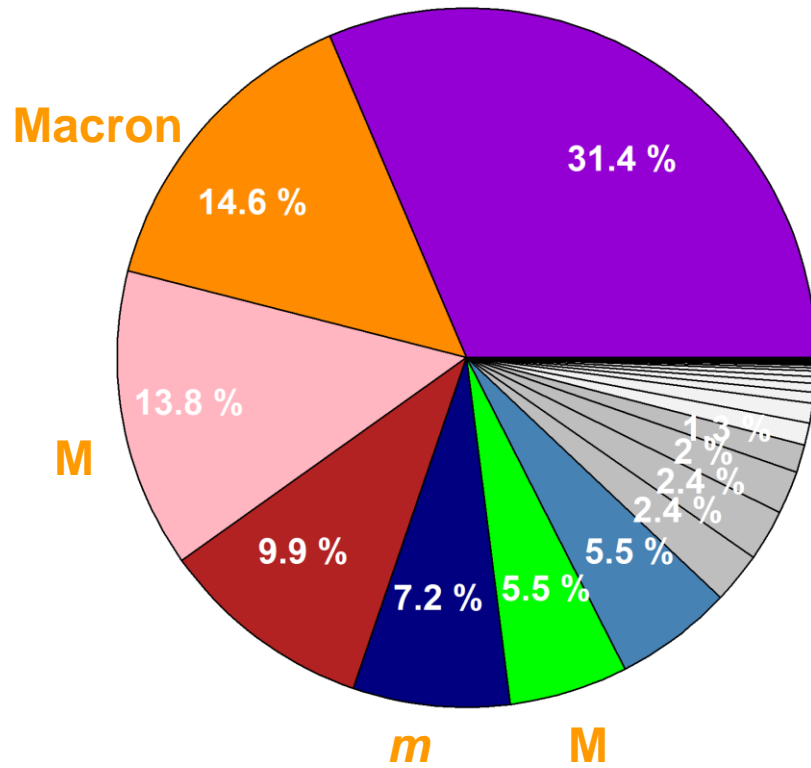
Sources : Ministère de l'Intérieur

FIGDATA

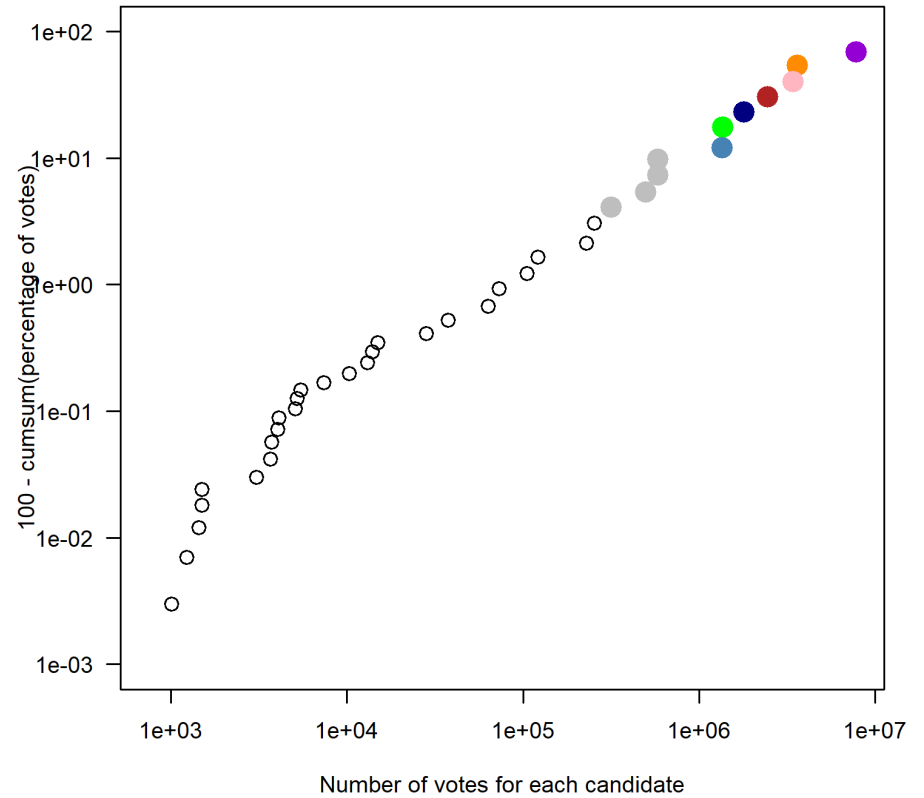


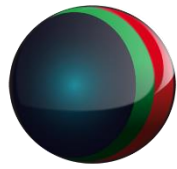
Some national results

June 2024 European elections in France
7 lists = 87,91 % of the votes, 4 lists (7.99 %) between 1.23 and 5 %



June 2024 European elections in France: Fat tail

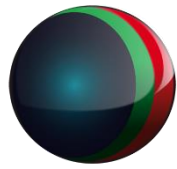




European elections: 577 circonscriptions **(same zonal divisions than the French parliament)**

EU2024 electoral data are public:

- <https://www.data.gouv.fr/fr/datasets/resultats-des-elections-europeennes-du-9-juin-2024/>
- **Several files:**
 - 70104 voting bureaux
 - 35270 municipalities
 - 577 deputy circonscriptions (= the French parliament)
 - 98 departments in France + overseas departments and territories + 11 circonscriptions for French people leaving outside France
 - 22 regions
 - All France
- I selected the file that corresponds to the 577 circonscriptions
- To simplify the analysis, I kept the 7 winners and aggregated the 31 lists in 2 groups: left (gauche) and right (droite) => 9 lists
- National data have no zero, I can apply:
 - PCA (Principal Component Analysis) on CLR (Centered Log-ratio) data
 - CA (Correspondance analysis) on untransformed data



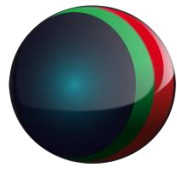
The dataset (after some transformation)

About the column names:

- **CDEP – LCIR:** Details of the 577 circonscriptions
- **INSC – EXPR:** Number of registered voters, Number of correct votes
- **BARDELLA – PDROITE:** Percentages of the 9 lists
- **cBARDELLA – cPDROITE:** Centered Log-Ratio
- **aBARDELLA – aPDROITE:** Alpha transformation (alpha=0.25)
- **eBARDELLA – ePDROITE:** weighted CLR (easyCODA)

```
> ht9(XC, n=2) # 577 x 42
Data.frame of dimension: 577 x 42
  CDEP          LDEP CCIR          LCIR  INSC  EXPR BARDELLA HAYER  GLUCKSMANN
0101  01          Ain 0101  1ère circonscription 86824 46887   37.44 13.98   12.13
0102  01          Ain 0102  2ème circonscription 102088 56962   36.73 14.82   11.88
ZZ10  ZZ Français établis hors de France ZZ10 10ème circonscription 113777 18842   14.31 18.16   12.17
ZZ11  ZZ Français établis hors de France ZZ11 11ème circonscription 104696 22555    9.48 23.64   16.48
  AUBRY BELLAMY TOUSSAINT MARECHAL PGAUCHE PDROITE cBARDELLA cHAYER cGLUCKSMANN cAUBRY cBELLAMY cTOUSSAINT
0101  6.50  7.72  4.37  5.95  5.72  6.19  1.457 0.471  0.329 -0.295 -0.122 -0.692
0102  7.66  7.92  4.90  5.88  4.75  5.46  1.437 0.530  0.309 -0.130 -0.097 -0.577
ZZ10 21.05  9.54  6.91  9.68  3.01  5.17  0.406 0.643  0.242 0.790 -0.001 -0.324
ZZ11  8.90  8.28 10.76 10.36  4.20  7.90 -0.057 0.860  0.499 -0.117 -0.189  0.073
  cMARECHAL cPGAUCHE cPDROITE aBARDELLA aHAYER aGLUCKSMANN aAUBRY aBELLAMY aTOUSSAINT aMARECHAL aPGAUCHE
0101 -0.383 -0.422 -0.343  1.923 0.397  0.233 -0.366 -0.219 -0.660 -0.436 -0.467
0102 -0.395 -0.608 -0.469  1.884 0.467  0.208 -0.227 -0.197 -0.582 -0.446 -0.604
ZZ10  0.013 -1.155 -0.614  0.352 0.649  0.168 0.852 -0.080 -0.366 -0.066 -0.922
ZZ11  0.035 -0.868 -0.236 -0.104 0.995  0.501 -0.162 -0.227  0.021 -0.017 -0.738
  aPDROITE eBARDELLA eHAYER eGLUCKSMANN eAUBRY eBELLAMY eTOUSSAINT eMARECHAL ePGAUCHE ePDROITE
0101 -0.405  1.036 0.051 -0.091 -0.714 -0.542 -1.112 -0.803 -0.842 -0.763
0102 -0.503  1.011 0.103 -0.118 -0.557 -0.524 -1.003 -0.822 -1.034 -0.895
ZZ10 -0.587  0.188 0.427  0.027 0.574 -0.218 -0.540 -0.203 -1.371 -0.830
ZZ11 -0.269 -0.146 0.767  0.406 -0.210 -0.282 -0.020 -0.058 -0.961 -0.329
```

Qi



PCA on the 577 circonscriptions

7514 = 75 Paris city, 14 is fourteen circonscription (different from arrondissement)

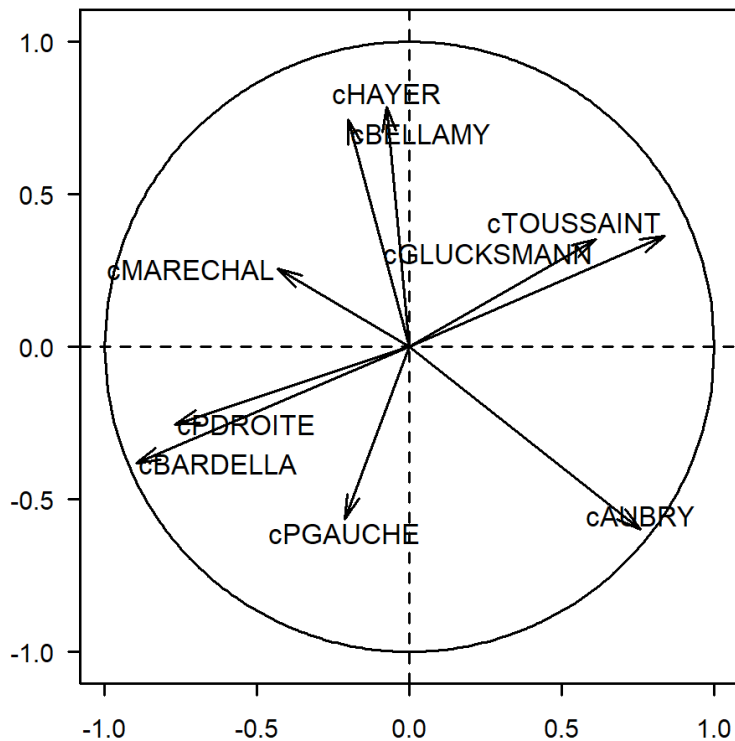
98801 = 988 Guadaloupe Island, 01 is first circonscription

ZZ08 = ZZ French zone outside France, 08 is for Italy, Greece, Turkey, Lebanon, Syria, Israel, Egypt, Chypre, Malte

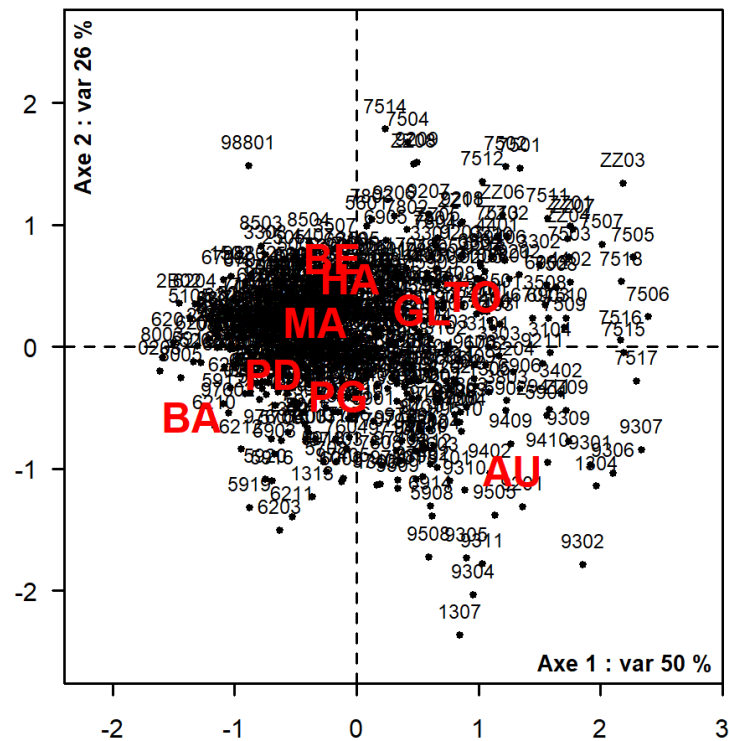
9302 = 93 Department of Seine Saint-Denis (north-east of Paris, formerly red suburb), 02 is second circonscription

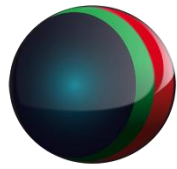
Analyse en composantes principales – Élections européennes 2024 – 577 circonscriptions

ACP corrélation des variables. Axes 1+2



ACP des individus. Axes 1+2





CA on the 577 circonscriptions

7514 = 75 Paris city, 14 is fourteen circonscription (different from arrondissement)

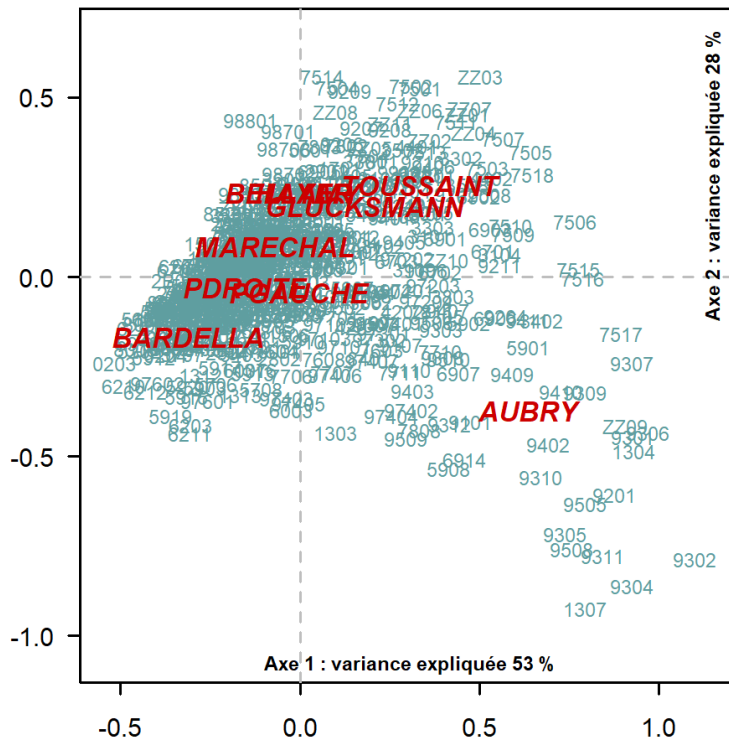
98801 = 988 Guadeloupe Island, 01 is first circonscription

ZZ08 = ZZ French zone outside France, 08 is for Italy, Greece, Turkey, Lebanon, Syria, Israel, Egypt, Chypre, Malte

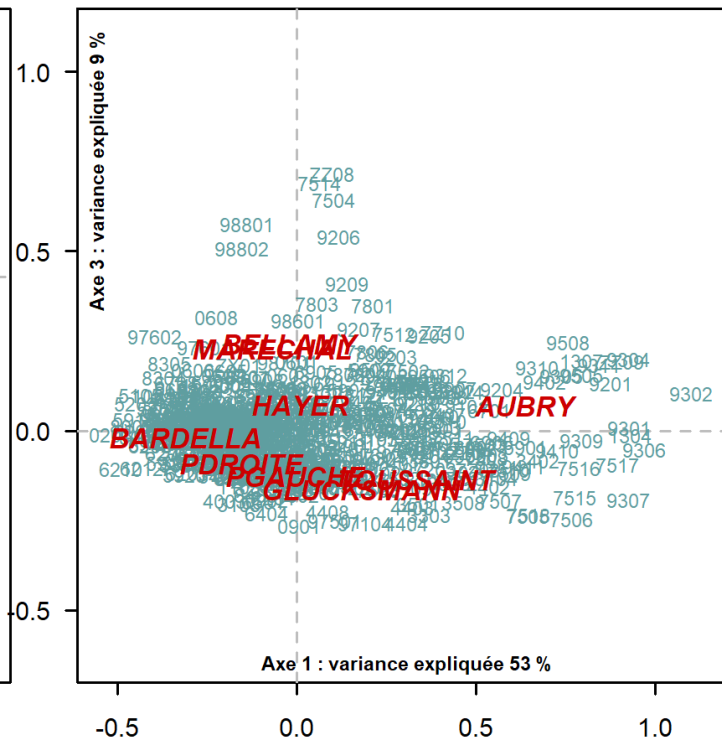
9302 = 93 Department of Seine Saint-Denis (north-east of Paris, formerly red suburb), 02 is second circonscription

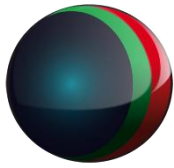
Élections européennes 2024 – 577 circonscriptions

Analyse des correspondances – Axes 1+2



Analyse des correspondances – Axes 1+3





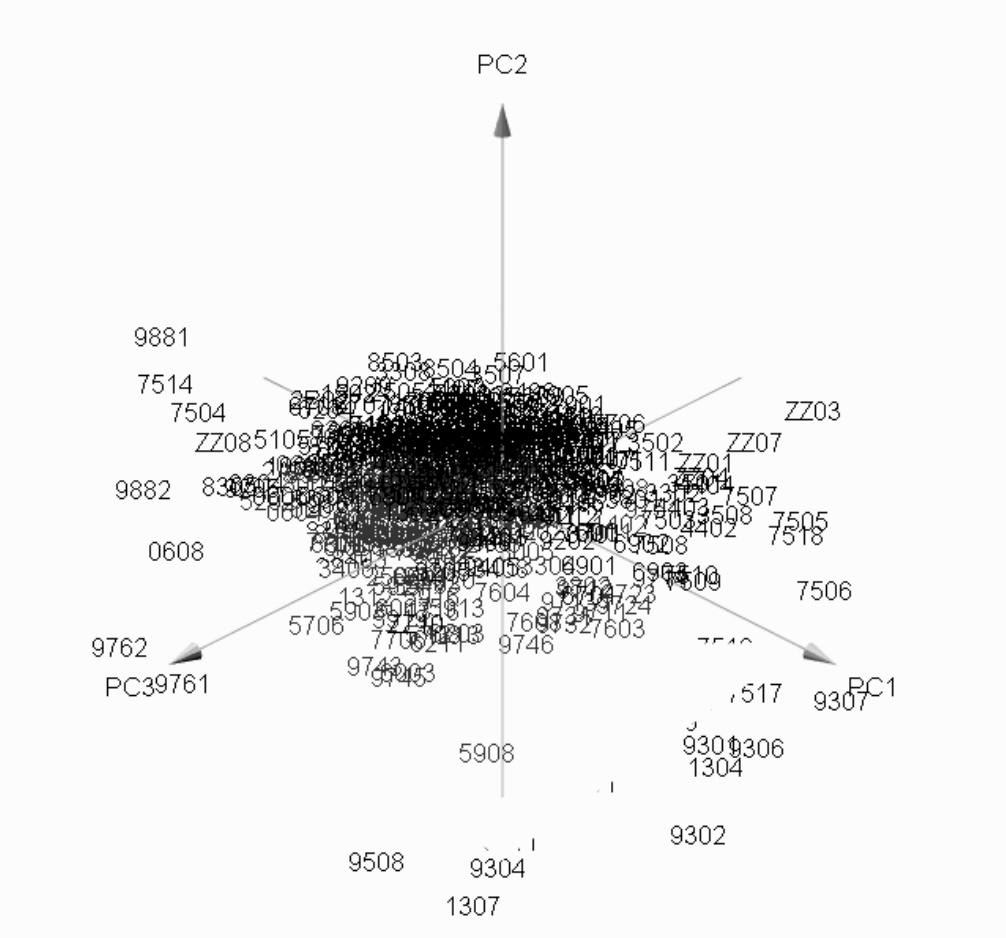
PCA on the 577 circonscriptions, 3D

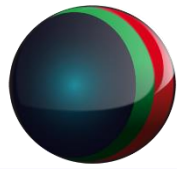
7514 = 75 Paris city, 14 is fourteen circonscription (different from arrondissement)

98801 = 988 Guadaloupe Island, 01 is first circonscription

ZZ08 = ZZ French zone outside France, 08 is for Italy, Greece, Turkey, Lebanon, Syria, Israel, Egypt, Chypre, Malte

9302 = 93 Department of Seine Saint-Denis (north-east of Paris, formerly red suburb), 02 is second circonscription





Votes > 50 %

16 candidates received more than 50 % of the votes and were elected on the first round:

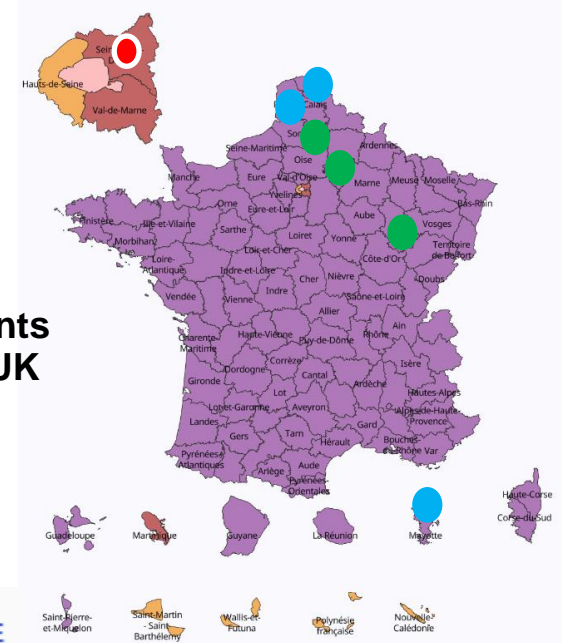
- BARDELLA (LE PEN, far-right): 14 candidates
- AUBRY (MÉLENCHON, far-left): 2 candidates

02, 80, 52 = Aisne + Somme + Haute-Marne => agricultural departments

59, 62 = Nord + Pas-de-Calais => desindustrialisation + migrants to UK

93 = Seine Saint-Denis => workers

97602 = Mayotte island => migrants from Comores archipel

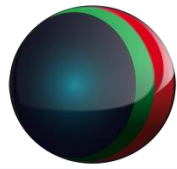


```
> XC9[apply(XC9,1,\(u) max(u) > 50),]
```

	BARDELLA	HAYER	GLUCKSMANN	AUBRY	BELLAMY	TOUSSAINT	MARECHAL	PGAUCHE	PDRITE
0201	50.21	11.68	8.16	4.72	6.10	2.86	4.60	4.95	6.72
0203	55.87	9.98	6.74	3.20	5.76	1.49	4.87	4.47	7.62
0204	50.85	11.44	7.81	6.18	5.55	2.34	4.99	4.73	6.11
5202	52.85	10.24	6.68	4.70	8.08	1.81	5.39	3.66	6.59
5912	50.81	11.04	6.92	5.10	5.24	2.29	4.45	7.46	6.69
5916	50.33	8.48	7.03	8.76	3.38	2.45	4.27	9.17	6.13
5918	51.95	11.93	6.81	3.88	6.28	1.95	5.56	5.20	6.44
5919	53.13	7.62	5.92	8.70	3.21	1.69	4.02	10.17	5.54
6203	52.10	7.45	6.25	10.39	2.45	2.15	3.34	9.79	6.08
6210	57.66	9.25	7.42	4.40	3.30	2.12	3.57	5.61	6.67
6211	54.53	7.26	6.54	11.28	2.72	2.32	3.25	6.36	5.74
6212	55.49	8.25	7.57	5.98	3.45	2.31	3.86	6.62	6.47
8005	51.84	12.04	6.38	4.13	6.28	1.61	4.54	4.71	8.47
9302	12.40	5.44	10.48	52.25	1.90	5.16	2.18	6.48	3.71
9304	18.47	5.70	6.34	50.38	2.73	2.17	2.96	6.09	5.16
97602	54.11	6.37	2.01	8.51	14.18	2.19	4.86	3.55	4.22



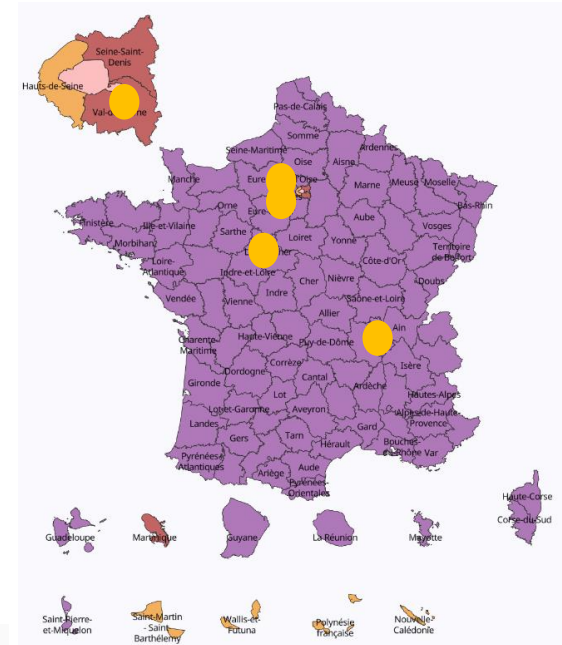
=> Circonscriptions that vote for the far-right / far-left also vote for the little known candidates



Votes of top 3 candidates < 52 %

Some circonscriptions do not choose
(and ignore the little known candidates):

- 37 = Indre et Loire
- 69 = Rhône (Lyon)
- 78,92 = Yvelines + Hauts-de-Seine (west of Paris)
- 94 = Val de Marne (south-east of Paris)
- ZZ02 = overseas French (Latin America)
- ZZ11 = overseas French (Russia to Australia)

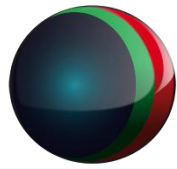


```
> XC9[names(which(FIRST3 < 52)),]
```

	BARDELLA	HAYER	GLUCKSMANN	AUBRY	BELLAMY	TOUSSAINT	MARECHAL	PGAUCHE	PDRITE
3701	16.19	15.62	20.18	15.07	8.22	9.44	5.32	5.27	4.69
6901	15.90	15.65	17.54	18.13	8.29	9.84	4.99	4.83	4.83
6904	14.40	18.09	17.25	13.56	12.14	9.26	6.89	4.29	4.12
7801	13.63	18.00	14.60	11.55	18.15	6.18	9.08	4.15	4.66
7805	16.24	21.18	14.41	12.49	12.72	6.76	7.03	4.23	4.94
9203	14.00	20.81	16.67	13.16	13.94	6.87	6.27	3.71	4.57
9205	13.01	17.64	15.84	17.57	14.01	6.30	7.82	3.81	4.00
9401	17.12	17.70	15.83	13.99	9.99	6.90	7.31	6.00	5.16
9405	17.63	17.10	15.29	16.44	9.74	6.41	6.64	5.31	5.44
9406	11.47	17.31	20.83	13.51	10.38	10.04	7.33	5.03	4.10
9408	17.12	15.22	16.59	14.35	11.08	7.92	8.08	4.72	4.92
ZZ02	8.19	22.84	16.00	12.41	9.21	11.72	9.04	4.46	6.13
ZZ11	9.48	23.64	16.48	8.90	8.28	10.76	10.36	4.20	7.90

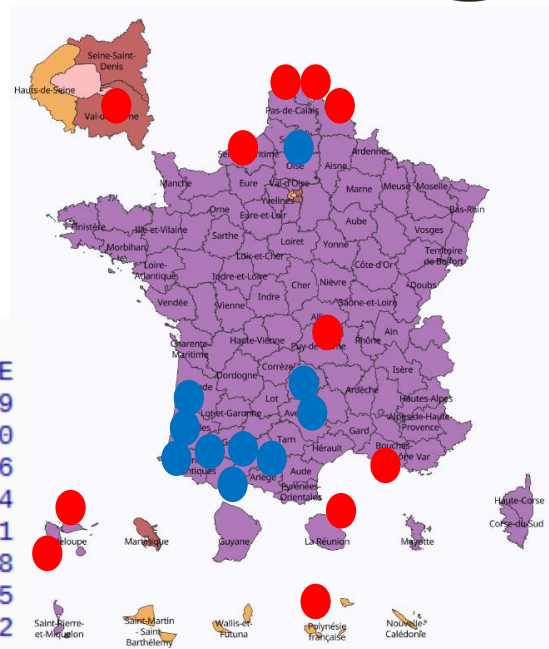


=> Circonscriptions that vote for the traditional parties do not vote for the little known candidates



Independante candidates have low scores

Candidates left/PGAUCHE are in urban areas and islands
Candidates right/PDROITE are in agricultural areas



```
> head(XC9[order(XC9$PGAUCHE, decreasing=TRUE),], n=10)
```

	BARDELLA	HAYER	GLUCKSMANN	AUBRY	BELLAMY	TOUSSAINT	MARECHAL	PGAUCHE	PDROITE
5920	47.64	9.12	5.92	7.78	3.50	2.60	3.96	13.49	5.99
97101	28.78	14.12	10.73	16.35	2.84	4.56	3.03	12.69	6.90
97406	32.15	7.93	12.03	17.15	3.85	4.14	5.04	10.45	7.26
5919	53.13	7.62	5.92	8.70	3.21	1.69	4.02	10.17	5.54
1313	43.96	8.36	8.17	12.14	3.04	2.82	5.44	10.06	6.01
6203	52.10	7.45	6.25	10.39	2.45	2.15	3.34	9.79	6.08
7608	33.32	11.55	11.27	15.89	3.74	4.20	4.10	9.78	6.15
6305	35.93	12.10	12.67	6.23	6.81	3.98	4.54	9.72	8.02
98702	21.65	38.53	3.79	6.17	2.82	6.72	4.73	9.40	6.19
97104	26.11	13.01	22.05	14.45	2.58	4.60	2.84	9.33	5.03

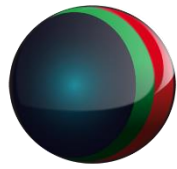
```
> head(XC9[order(XC9$PDROITE, decreasing=TRUE),], n=10)
```

	BARDELLA	HAYER	GLUCKSMANN	AUBRY	BELLAMY	TOUSSAINT	MARECHAL	PGAUCHE	PDROITE
6404	24.13	12.93	15.62	5.67	5.32	5.77	4.35	6.98	19.23
4003	31.56	13.12	17.57	3.99	5.36	2.65	4.59	6.08	15.08
6403	29.40	13.84	16.55	5.81	5.04	4.80	4.79	5.60	14.17
1203	28.74	13.81	14.82	6.02	7.09	5.14	5.04	5.60	13.74
8003	46.09	12.40	6.99	3.29	7.13	1.67	4.31	5.66	12.46
4001	32.77	14.52	15.89	4.98	5.28	3.59	5.33	5.43	12.21
3201	30.31	13.20	17.66	5.74	5.72	4.60	5.14	5.68	11.95
1202	28.33	14.22	16.53	7.31	6.55	4.30	4.86	6.02	11.88
0902	34.22	9.65	16.06	9.11	3.58	4.97	5.10	5.59	11.72
6501	30.62	13.50	17.34	6.70	4.31	4.46	4.57	6.80	11.70

=> Independant candidates with local notoriety are in areas far away from Paris.

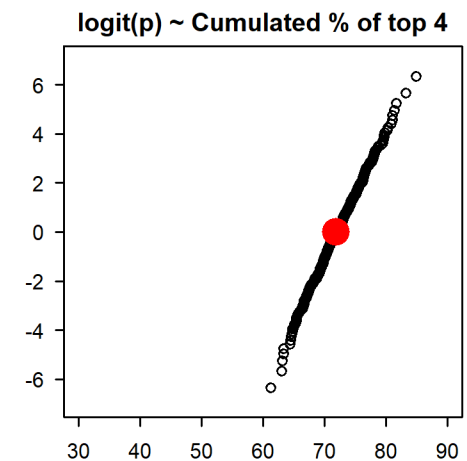
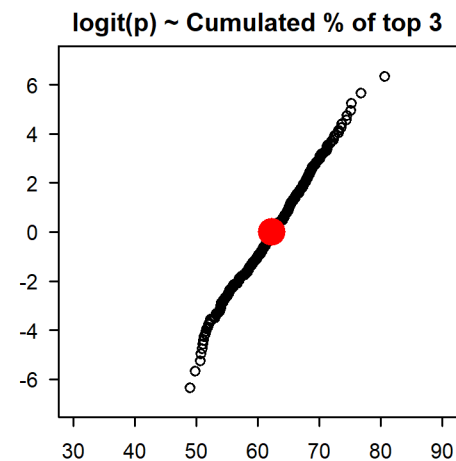
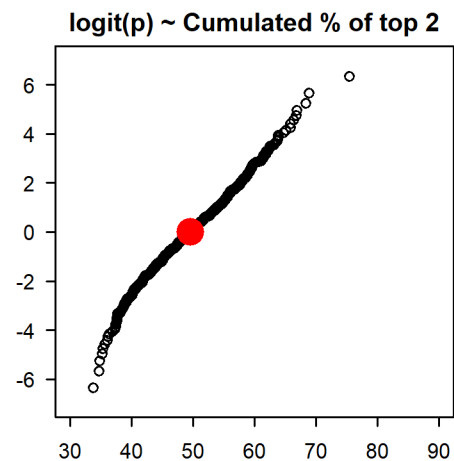
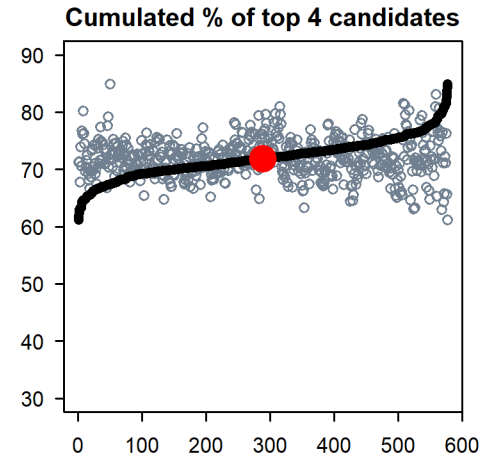
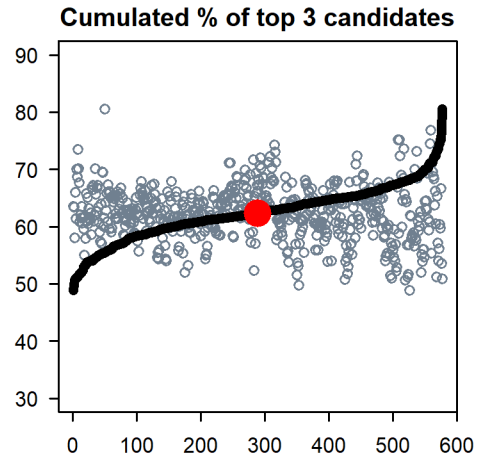
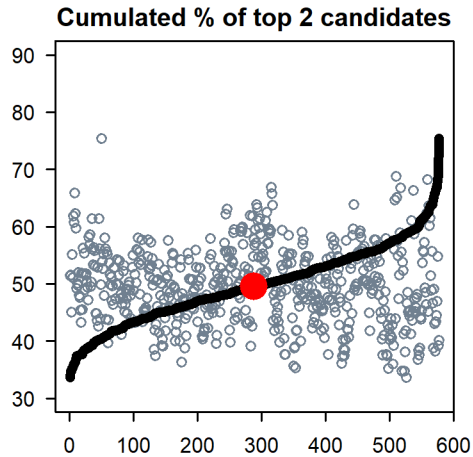
Some of them replace the traditional parties.

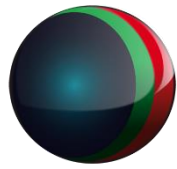




Cumulated % of votes for top 2, 3, 4 candidates + logit(p) representation

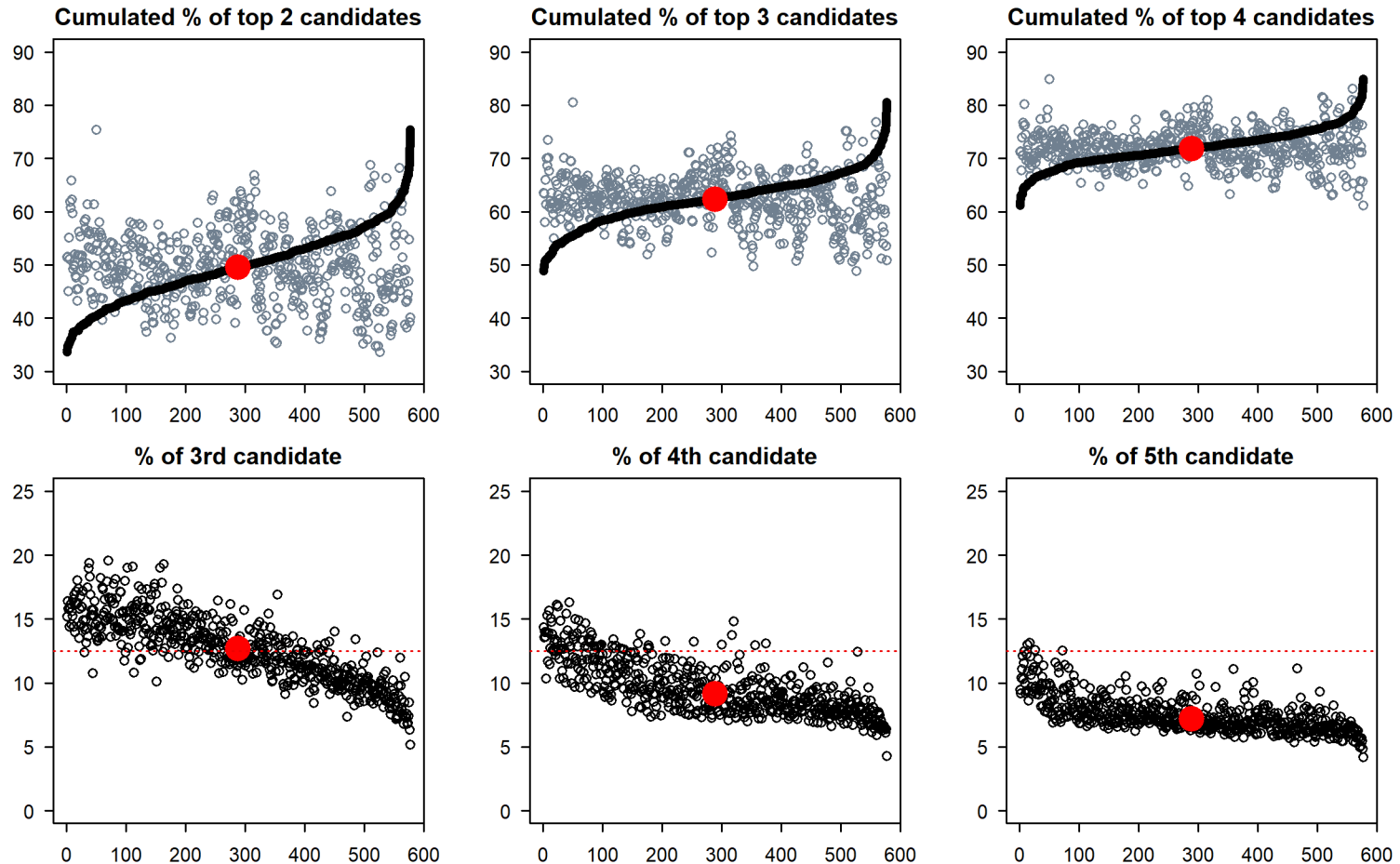
European Elections 2024 in France: 577 circonscriptions



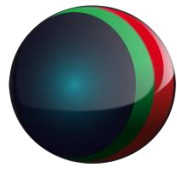


Cumulated % of votes for top 2, 3, 4 candidates + Next candidate

European Elections 2024 in France: 577 circonscriptions



The 12.5 % horizontal line (adjusted to the participation ratio, could reach 18 %) is the threshold to accept the third (and fourth) candidate(s) to the second round of in the French parliamentary elections



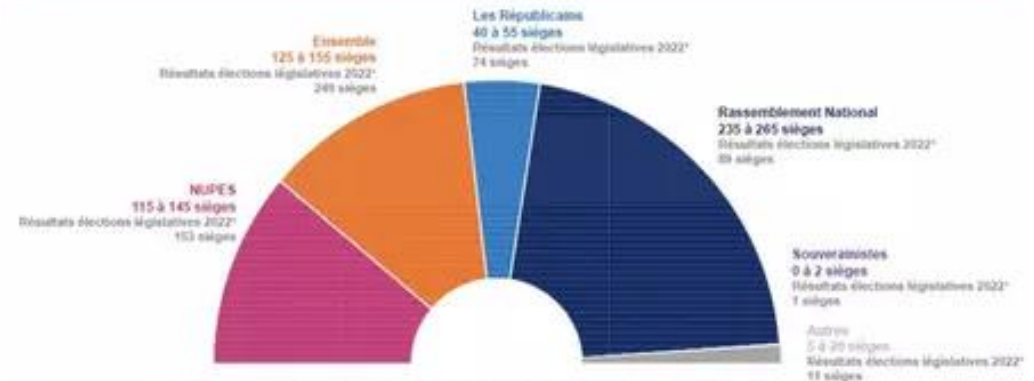
And E. Macron decided to dissolve the lower chamber of the French parliament



Projection of EU2024 results on FrenchParliament2024 results

Composition projetée de l'Assemblée nationale

Projection en sièges à l'Assemblée nationale

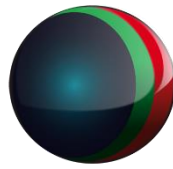


toluna+ harris interactive

Rappel : Les intentions de vote permettant cette projection mesurent un rapport de force à un moment donné. Elles ne peuvent en aucun cas être considérées comme étant prédictives des résultats du scrutin.
*Source : Ministère de l'Intérieur

=> Macron + friends < 35 %

Legislative elections: the voting system

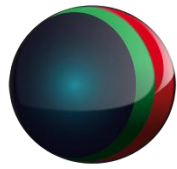


Key points:

- Two rounds
- 577 seats / circonscriptions (mainland + islands + French overseas)
- Vote is for individual candidates (+ one substitute per candidate)
- Candidates must keep a proper account, and prove it
- Candidates must provide and pay for the printing material
- Candidates that reach the threshold [**score*ParticipationRate > 12.5 %**] are qualified for the second round
 - They are named Triangular or Quadrangular elections
(Example: if the participation rate is **70 %**, then the threshold is **17.85 %**)
 - If score is > 50 % but the threshold is not reached, then second round
- The candidate who arrives first at the second round is elected

Consequences:

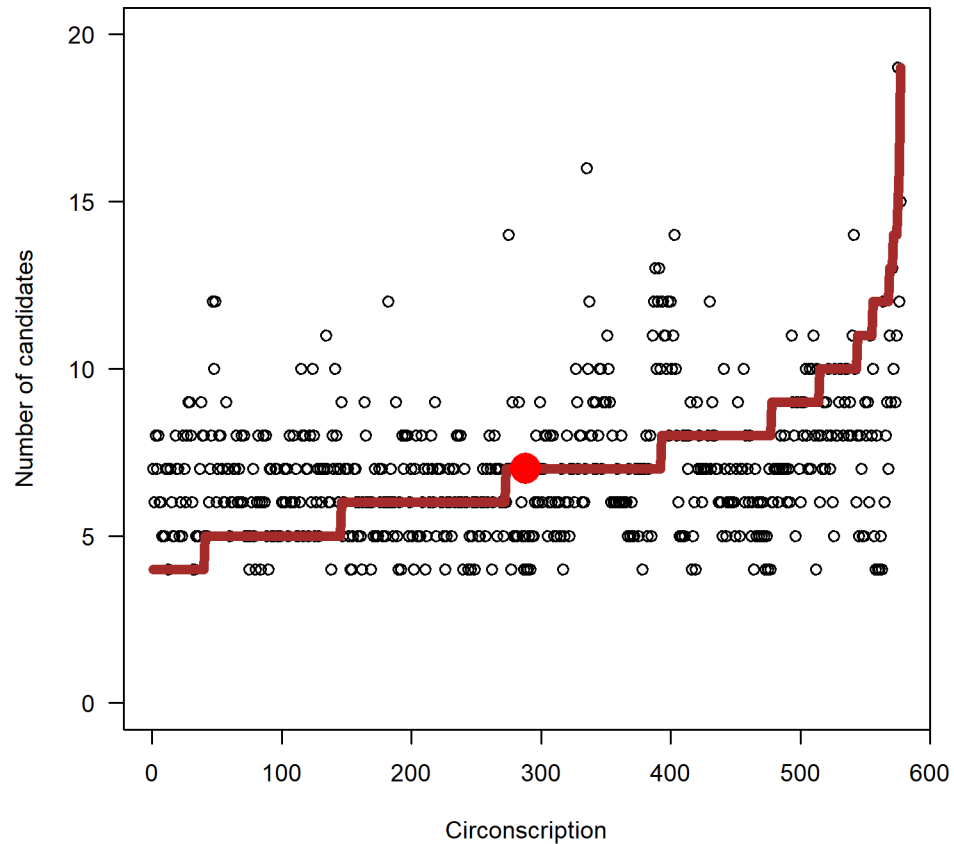
- 4009 candidates
- 4 to 11 candidates per seat / circonscription
- Individual notoriety is much more important

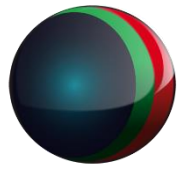


LEG2024-T1 on 577 circonscriptions

Within one week, 4009 individuals + substitutes + proof of an accountant were able to register and run for this unplanned election !!

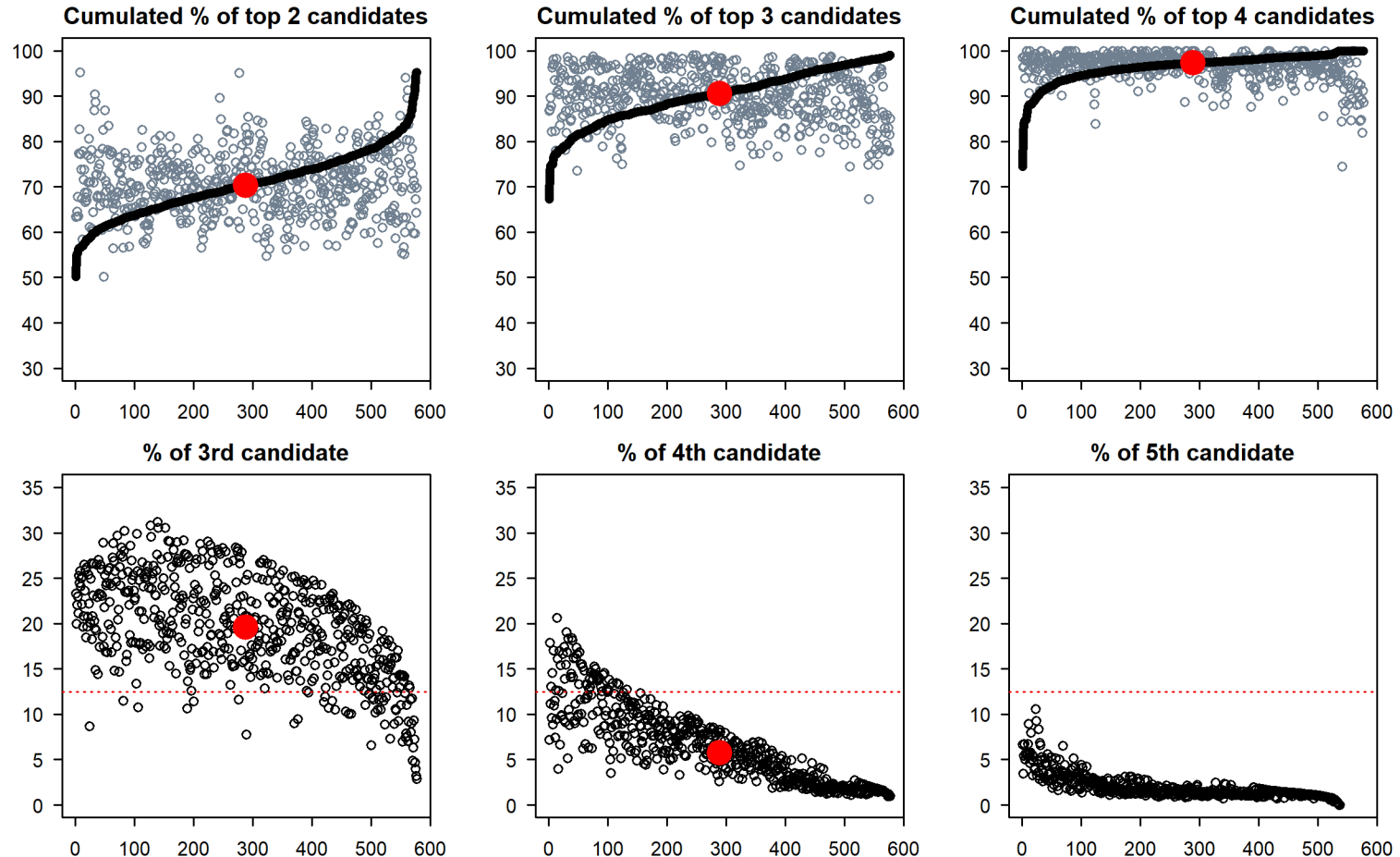
LEG2024-T1 in France: Number of candidates per circonscription



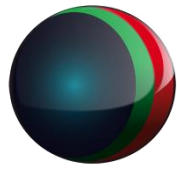


Cumulated % of votes for top 2, 3, 4 candidates + Next candidate

Legislatives Elections 2024 in France: 577 circonscriptions

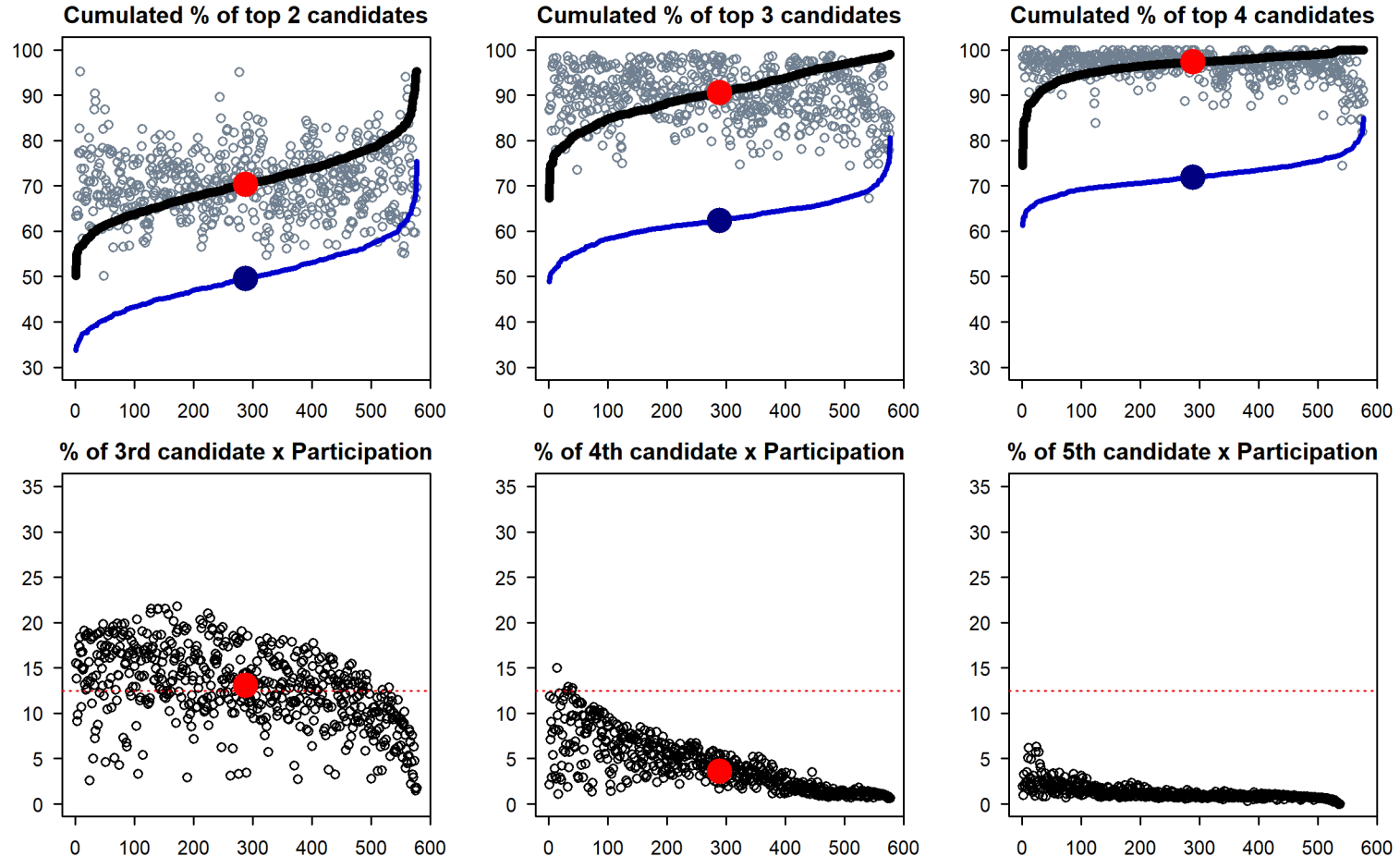


The 12.5 % horizontal line (need to be adjusted with the participation ratio, could reach 18 %) is the threshold to accept the third (and fourth) candidate(s) to the second round of in the French parliamentary elections

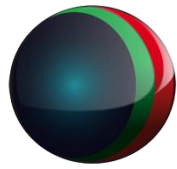


Cumulated % of votes for top 2, 3, 4 candidates + Next candidate adjusted by participation

Legislatives Elections 2024 in France (+EU2024 in blue): 577 circonscriptions

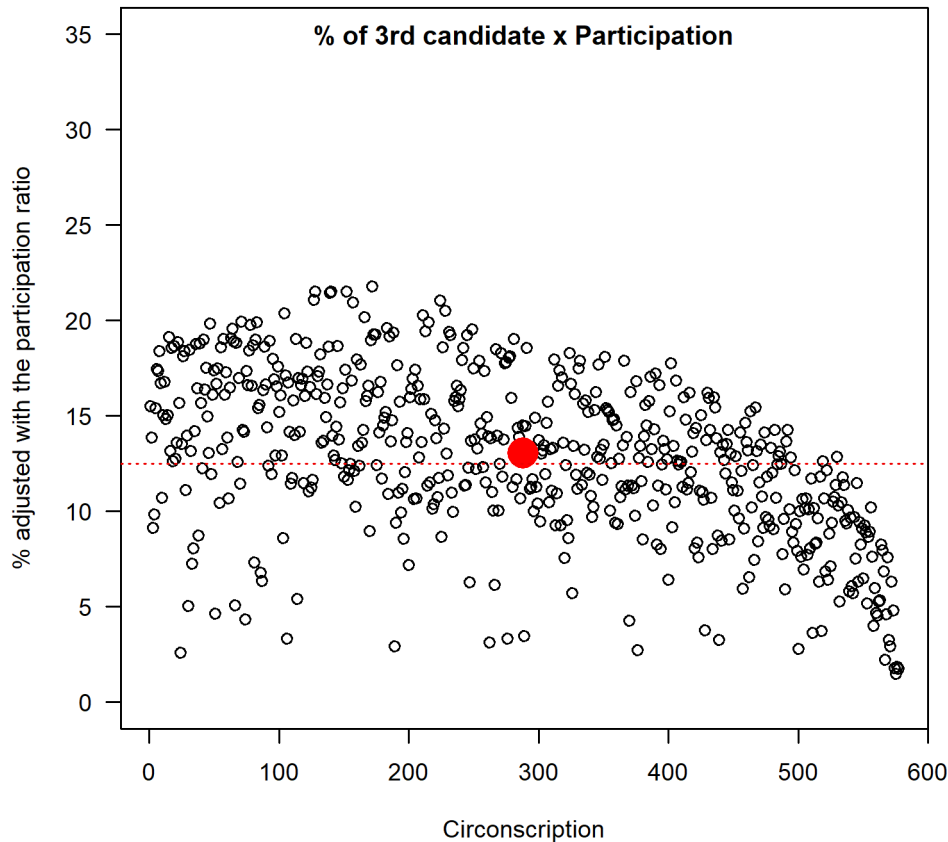


The 12.5 % horizontal line, here adjusted with the participation ratio, is the threshold to accept the third (and fourth) candidate(s) to the second round of in the French parliamentary elections



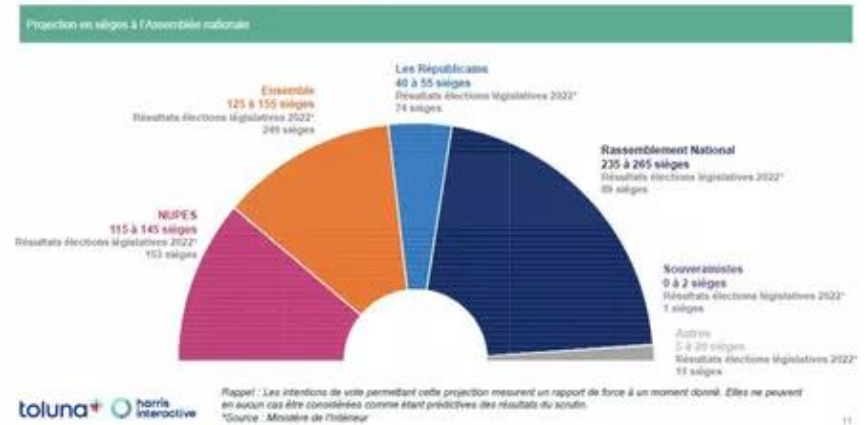
LEG2024-T1 on 577 circonscriptions

317 candidates in third position qualified for the second round !!

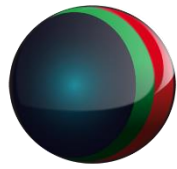


Projection of EU2024 results on FrenchParliament2024 results

Composition projetée de l'Assemblée nationale



For the first time in the recent French election history (5th republic 1958 ~), triangular fights could give a relative majority to the far-right party, which is strong in agricultural and desindustrialized areas

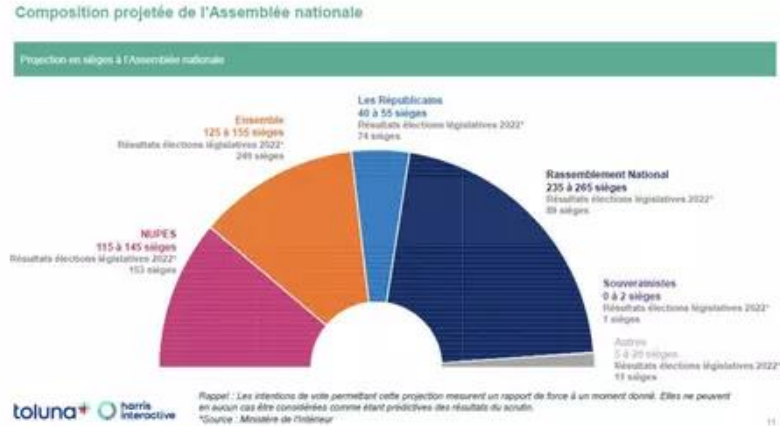


From LEG2024-round-1 to round-2

But the French electoral law allows any candidate to resign between the first and the second round.

And suddenly, traditional parties who oppose each other agree to sideline the far-right party.

And some intelligent / shameful maneuvers began to force the 3rd candidate to resign in favour of top 1 or top 2 candidates.



Résultats du second tour des élections législatives 2024

Les résultats du premier tour des élections législatives 2024 sont disponibles. Le scrutin du premier tour a eu lieu le 30 juin 2024 et celui du second tour se déroulera le 07 juillet 2024, les résultats seront disponibles à partir de 20h00.

Here are the results of LEG2024-Round-2. Just unpredictable.



E. Macron has been saved by his fierced opponents in the (far-)left party.

The government is totally unstable.

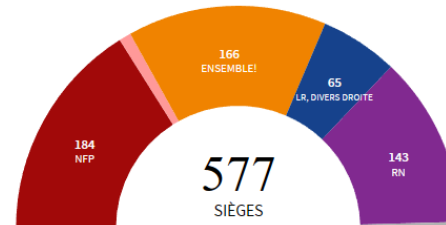
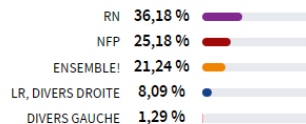
7 JUILLET 2024 |

Législatives 2024

RÉSULTATS 2ND TOUR

Résultats En % des suffrages

Source : Ministère de l'Intérieur



Résultats par parti En nombre de sièges

Source : Ministère de l'Intérieur



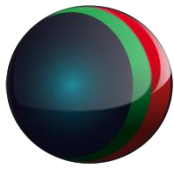
PARTICIPATION à 20:00 66,63%

2022 : 46,23% Source : Ministère de l'Intérieur

0 Majorité absolue (289) 577



Conclusion 1

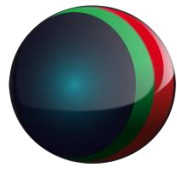


EU2024

- Elections with one round + proportional vote favours a large number of lists/candidates.
- French electors like this diversity.
- Based on EU2024 election, in average (median), TOP 2 candidates receive 50 % of the total vote, and candidate 7 has still an acceptable score.
- The vote for minor / independant candidates is higher in areas
 - Strong agricultural place
 - Vote for far-right/far-left is important ⇔ disillusioned people (do not trust politicians)

LEG2024

- Elections with two rounds reduce the number of candidates.
- Still, individual candidates with strong notoriety can get elected.
- Based on LEG2024-Round1 election, in average (median), TOP 2 candidates receive 70 % of the total vote.
- Candidate 3 has still an acceptable score in 1 out of 4 cases (classical legislative election)
- This LEG2024-Round1 is very special, with $317/577 = 55$ % of circonscriptions with qualified third candidates.



Power sizing in old and modern times

« The revolutionary party will bring together men tried, professionally prepared and educated by long practice, perfectly in agreement with each other. [...] If these qualities are combined, we will have something more than democracy: a complete fraternal trust between revolutionaries. »

« If the tactical goal of the party is to take power, the strategic goal is to transform society – and even to transform man. »

Vladimir Ilyich Lénine

**Donald Trump and Elon Musk are probably not Russian assets,
but they seem to be good Lenine's students ...**



Thank you for your attention

patrice.kiener@inmodelia.com

Tel : +33.9.53.45.07.38

Paris + University of Crete – 5 February 2025