

Elections 2022

Federative Republic of Brazil
Document under confidentiality - Prohibited Disclosure

Compliance Analysis

October 29th, 2022

CONFIDENTIAL

2022 FIRST ROUND BRAZILIAN PRESIDENTIAL ELECTIONS VULNERABILITY ANALYSIS REPORT

INTRODUCTION

The present document aims to report, from the perspective of a Forensic Science consolidated method based on a statistical analysis observational process, the 2022 First round Brazilian Election counting data. The observational method used is Benford's Law.

The observed data used is available on the Brazilian Superior Electoral Court's (*Tribunal Superior Eleitoral - TSE*).

NEWCOMB-BENFORD'S LAW

Benford's Law, also called the law of the first digit, or Newcomb-Benford's Law, and the law of anomalous numbers, refers to the distribution of digits in various sources of real cases. Instead of expected homogeneity, the law states in many naturally occurring numbers collections the first significant digit is likely to be small. Without homogeneity, this distribution shows digit 1 has probability of appearing 30% in a statistical data set, while larger values are less likely to appear.

Frank Benford has shown this result applies to a wide variety of data sets, including electricity bills, addresses, stock prices, private equity prices, population numbers, death rates, river lengths, physical and mathematical constants, by power laws (which are very common in nature). All these statements are calculated or defined on a logarithmic scale.

Probability	0	1	2	3	4	5	6	7	8	9
1st position	---	30.1	17.6	12.5	9.7	7.9	6.7	5.8	5.1	4.6
2nd position	12	11.4	10.9	10.4	10	9.7	9.3	9	8.8	8.5
3th position	10.2	10.1	10.1	10.1	10	10	9.9	9.9	9.9	9.8

NEWCOMB-BENFORD'S LAW APPLICATIONS

- Judicial Evidence
- Electoral Data Analysis
- Macroeconomic Data
- Tax Fraud Analysis of
- Genome Data Analysis
- Scientific Fraud Detection

Following Benford's Law, or Looking Out for No. 1

By MALCOLM W. BROWNE AUG. 4, 1998

DR. THEODORE P. HILL asks his mathematics students at the Georgia Institute of Technology to go home and either flip a coin 200 times and record the results, or merely pretend to flip a coin and fake 200 results. The following day he runs his eye over the homework data, and to the students' amazement, he easily fingers nearly all those who faked their tosses.

"The truth is," he said in an interview, "most people don't know the real odds of such an exercise, so they can't fake data convincingly."

There is more to this than a classroom trick.

Dr. Hill is one of a growing number of statisticians, accountants and mathematicians who are convinced that an astonishing mathematical theorem known as Benford's Law is a powerful and relatively simple tool for pointing suspicion at frauds, embezzlers, tax evaders, sloppy accountants and even computer bugs.

(Benford's Law in New York Times)

[<https://www.nytimes.com/1998/08/04/science/following-benford-s-law-or-looking-out-for-no-1.html>]

Benford's Law in Brazil

Written on **Auditors Brazilian Court (TCU)** website:

"Several studies have been conducted adopting the hypothesis that fabricated data is identified by digits deviation with respect to Benford's distribution."

*"Walter Mebane, an American statistician at the University of Michigan, has studied **election data from several countries**, including the United States, Russia, and Mexico."*

*"The researcher analyzed the data from the **Iranian elections in 2009** and found anomalies that strongly indicated the occurrence of fraud in the victory of politician Ahmadinejad (Mebane, 2009)."*

[<https://portal.tcu.gov.br/imprensa/noticias/aplicacoes-da-lei-de-benford-a-auditoria-de-obras-publicas.htm>]

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Aplicações da Lei de Benford à auditoria de obras públicas

As análises de preços nas auditorias de obras públicas por vezes ocupam semanas de trabalho do auditor, pois, em muitos casos, as planilhas orçamentárias são extensas e de difícil análise. A Lei Newcomb-Benford é uma ferramenta de mineração de dados, alternativa à Curva ABC, que permite uma seleção possivelmente mais precisa dos serviços das planilhas para análise de preço.

</inovatcu/noticias/aplicacoes-da-lei-de-benford-a-auditoria-de-obras-publicas.htm>

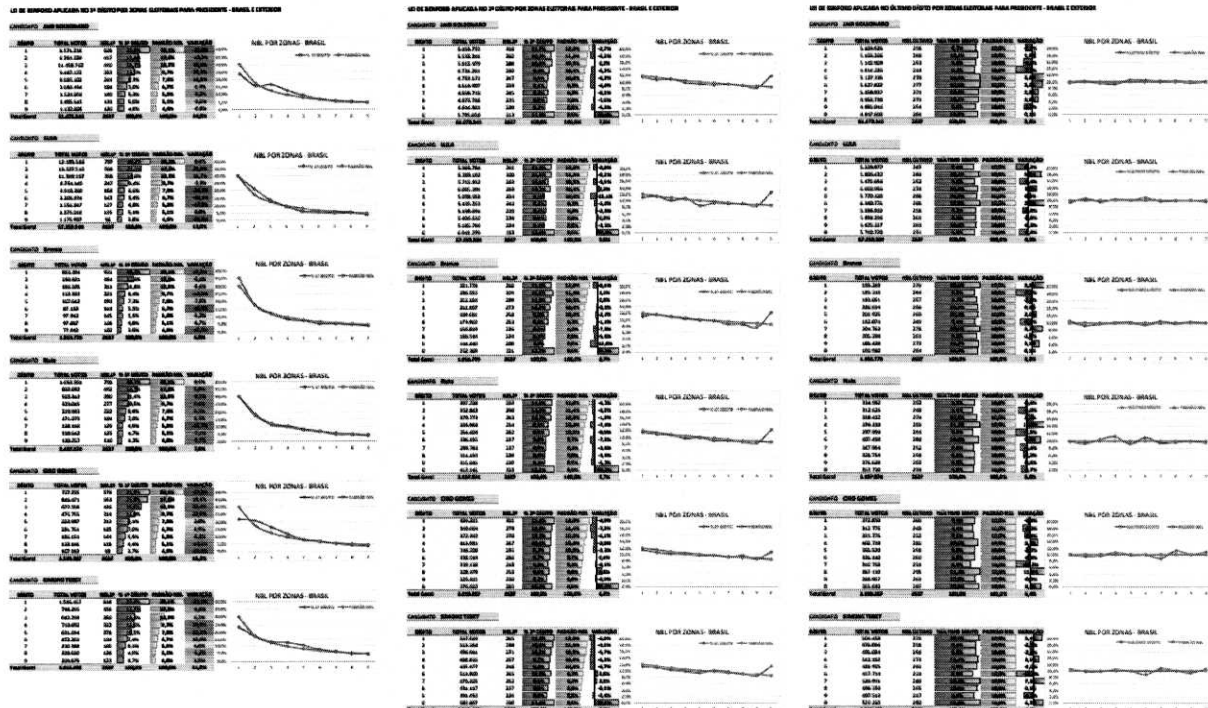
Walter Mebane, um estatístico americano da Universidade de Michigan, estudou dados eleitorais de vários países, incluindo os Estados Unidos, Rússia e México. Em 2006, ele descobriu que a contagem dos votos tendia a seguir a Lei de Benford no segundo dígito (Mebane, 2006). O pesquisador analisou os dados das eleições iranianas em 2009 e encontrou anomalias que indicavam fortemente a ocorrência de fraude na vitória do político Ahmadinejad (Mebane, 2009). Mebane verificou que, nas cidades com poucos votos inválidos, os números de Ahmadinejad passavam longe da distribuição de Benford e que o candidato, nessas situações, possuía uma grande vantagem nos votos.

Considering the highest national auditing body recognizes and propagates the use of Benford Logic in public audits, including at the electoral level, we began to analyze the

2022 Brazilian presidential election first round data. This technique allows us to make very quick conclusions about the numerical sets's consistency.

NEWCOMB-BENFORD'S LAW IN BRAZILIAN ELECTIONS

The 2022 Brazilian presidential election first round data analysis revealed statistical sets inconsistencies. This fact does not assert itself there was intervention or data external tampering. This can only be affirmed after meticulous and detailed investigation from the standpoint of defending the National Sovereignty interests. There was undoubted proof of external access to the electoral operation system in recent past elections. The subject was headlined in several media and the electoral system operator itself recognized this fact, including the forwarding of documents to police authorities. But the 2022 numerical indications - regardless of this fact and before considering whether there were external vulnerabilities in the last election - corroborate the need for protective measures as a precautionary measure. See the electoral zone grouping charts below.



As an example, this is a panoramic view of data analysis grouped by electoral zones. It is possible to verify there are many numerical sets, in different readings and formats, that

present apparent non-conformities with the NBL parameters, which will be the object of specific deeper analysis.

Pure data was used for the analysis, obtained from the TSE (Superior Electoral Court) data repository. [<https://www.tse.jus.br/eleicoes/eleicoes-2022/divulgacao-dos-resultados-das-eleicoes-2022>]

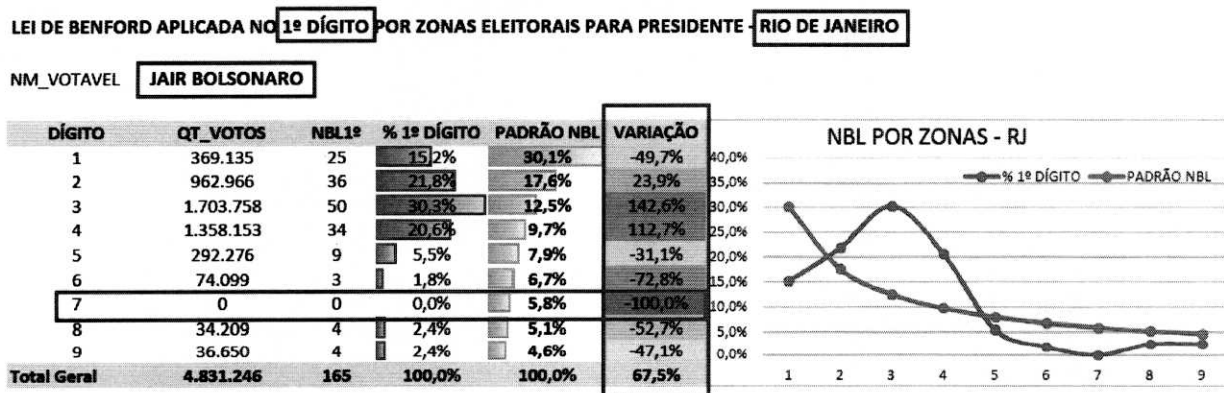
The data was properly decompressed and inserted in appropriate databases - in parallel and redundant checking operations - in order to preserve the originality of the data in the imported tables. The main analysis was restricted and concentrated on the position for president, reaching the candidates with the 4 highest votes, and also comparing the "White" and "Null" votes.

The application of the 1st digit rule for NBL requires numbers that meet all numeric series that reach the digits 1 to 9, in the case of Electoral Zones and Cities. Both serve the purpose of leveraging the NBL (Newcomb-Benford Law) rule. However, the study done by cities, if performed with a very restricted universe, may generate distortions.

The population distance between the largest and the smallest electoral zone in Brazil has a smaller interval than the population distance between the smallest and the largest Brazilian municipality.

The first study part uses the 1st digit NBL rule, in which the 2,637 Electoral Zones in Brazil and abroad were evaluated. The presence of distortion is noted, where the average deviation exceeds the possible margins of error.

As an initial planimetric overview, some graphs are presented in sequence. These are the data will be further study object (1):

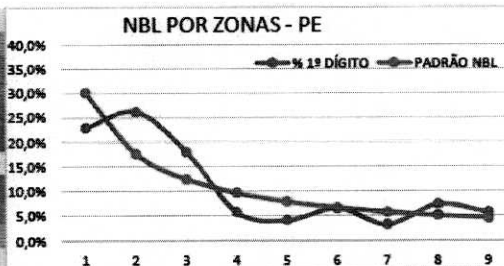


(1) This table contains the UMIs - Minimal Informational Units - used for the present study. It will be repeated several times during the text. It is generated in Portuguese, because it reflects images captured directly from the primary data processing. Its columns are as follows, with their respective meanings in English: Digit/Quantity Votes / NBL1st / %1st Digit/ NBL Pattern / Variation / NBL by Zones / Total

LEI DE BENFORD APLICADA NO 1º DÍGITO POR ZONAS ELEITORAIS PARA PRESIDENTE - PERNAMBUCO

NM_VOTAVEL JAIR BOLSONARO

DÍGITO	QT_VOTOS	NBL1º	% 1º DÍGITO	PADRÃO NBL	VARIACÃO
1	313.796	28	23,0%	30,1%	-23,8%
2	354.527	32	26,2%	17,6%	48,3%
3	570.906	22	18,0%	12,5%	44,4%
4	140.155	7	5,7%	9,7%	-40,8%
5	28.070	5	4,1%	7,9%	-48,3%
6	51.005	8	6,6%	6,7%	-2,0%
7	30.521	4	3,3%	5,8%	-43,5%
8	76.150	9	7,4%	5,1%	44,1%
9	65.808	7	5,7%	4,6%	25,3%
Total Geral	1.630.938	122	100,0%	100,0%	35,7%



NM_VOTAVEL LULA

DÍGITO	QT_VOTOS	NBL1º	% 1º DÍGITO	PADRÃO NBL	VARIACÃO
1	504.494	31	25,4%	30,1%	-15,6%
2	1.003.556	42	34,4%	17,6%	95,5%
3	650.745	19	13,6%	12,5%	24,7%
4	816.827	18	13,8%	9,7%	52,3%
5	573.275	11	9,0%	7,9%	13,8%
6	0	0	0,0%	6,7%	-100,0%
7	0	0	0,0%	5,8%	-100,0%
8	0	0	0,0%	5,1%	-100,0%
9	9.425	1	0,8%	4,6%	-82,1%
Total Geral	3.558.322	122	100,0%	100,0%	64,0%



LEI DE BENFORD APLICADA NO 1º DÍGITO POR ZONAS ELEITORAIS PARA PRESIDENTE - CEARA

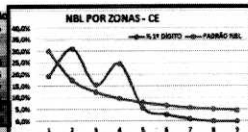
NM_VOTAVEL JAIR BOLSONARO

DÍGITO	QT_VOTOS	NBL1º	% 1º DÍGITO	PADRÃO NBL	VARIACÃO
1	886.448	29	27,8%	30,1%	-7,3%
2	864.466	32	27,8%	17,6%	56,8%
3	862.256	19	27,8%	12,5%	55,2%
4	32.130	7	6,6%	9,7%	-31,9%
5	32.387	6	5,5%	7,9%	-30,9%
6	51.082	8	7,3%	6,7%	8,2%
7	60.379	8	7,3%	6,7%	8,2%
8	50.863	6	5,5%	7,9%	-30,9%
9	38.455	4	3,7%	4,6%	-19,1%
Total Geral	1.971.627	189	100,0%	100,0%	21,3%



NM_VOTAVEL LULA

DÍGITO	QT_VOTOS	NBL1º	% 1º DÍGITO	PADRÃO NBL	VARIACÃO
1	246.700	21	18,9%	30,1%	-36,9%
2	836.121	34	29,7%	17,6%	67,6%
3	604.237	17	16,0%	12,5%	27,2%
4	1.211.879	27	24,0%	9,7%	59,8%
5	208.723	6	5,5%	7,9%	-30,9%
6	195.439	3	2,8%	6,7%	-58,2%
7	78.237	1	0,8%	5,8%	-86,7%
8	0	0	0,0%	5,1%	-100,0%
9	0	0	0,0%	4,6%	-100,0%
Total Geral	1.971.627	189	100,0%	100,0%	61,9%



LEI DE BENFORD APLICADA NO 1º DÍGITO POR ZONAS ELEITORAIS PARA SENADOR - CEARA

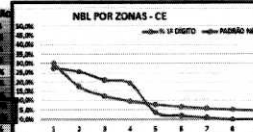
NM_VOTAVEL EMILIA CARDOSO

DÍGITO	QT_VOTOS	NBL1º	% 1º DÍGITO	PADRÃO NBL	VARIACÃO
1	130.142	23	23,0%	30,1%	-23,6%
2	891.528	22	23,0%	17,6%	30,7%
3	297.791	17	13,2%	12,5%	6,4%
4	31.869	7	5,4%	9,7%	-44,3%
5	61.235	11	11,1%	7,9%	40,6%
6	51.712	8	7,3%	6,7%	8,2%
7	88.256	5	4,5%	5,8%	-22,8%
8	51.982	7	6,4%	4,6%	39,1%
9	18.212	3	2,8%	4,6%	-39,1%
Total Geral	1.878.272	189	100,0%	100,0%	23,3%



NM_VOTAVEL CAMILO

DÍGITO	QT_VOTOS	NBL1º	% 1º DÍGITO	PADRÃO NBL	VARIACÃO
1	483.721	30	24,0%	30,1%	-20,3%
2	685.476	28	24,0%	17,6%	35,8%
3	831.141	23	24,0%	12,5%	48,0%
4	952.141	21	24,0%	9,7%	59,8%
5	214.723	4	3,7%	7,9%	-52,7%
6	129.025	2	1,8%	6,7%	-73,9%
7	23.256	1	0,8%	5,8%	-86,7%
8	0	0	0,0%	5,1%	-100,0%
9	0	0	0,0%	4,6%	-100,0%
Total Geral	2.880.523	189	100,0%	100,0%	61,9%

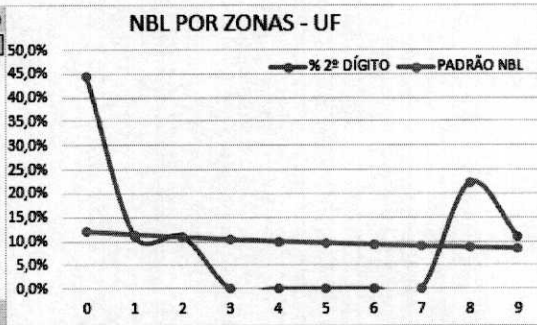


The cases above (RJ, CE and PE States) were demarcated because they showed a high incidence of "zero" in cells where there should be a positive value. They are here placed as detected anomalies at the State level examples. However, their isolated study cannot be dissociated from the global study with aggregated data.

LEI DE BENFORD APLICADA NO 2º DÍGITO POR ZONAS ELEITORAIS PARA PRESIDENTE - POR UF

UF **AC**
CANDIDATO **JAIR BOLSONARO**

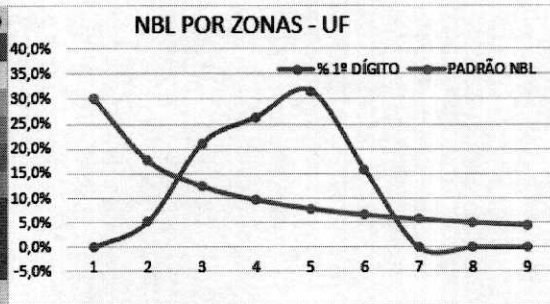
DÍGITO	TOTAL VOTOS	NBL2º	% 2º DÍGITO	PADRÃO NBL	VARIAÇÃO
0	90.614	4	44,4%	12,0%	269,4%
1	6.191	1	11,1%	11,4%	-2,5%
2	72.734	1	11,1%	10,9%	1,9%
3	0	0	0,0%	10,4%	100,0%
4	0	0	0,0%	10,0%	100,0%
5	0	0	0,0%	9,7%	100,0%
6	0	0	0,0%	9,3%	100,0%
7	0	0	0,0%	9,0%	100,0%
8	36.817	2	22,2%	8,8%	252,3%
9	69.226	1	11,1%	8,5%	30,7%
Total Geral	275.582	9	100,0%	100,0%	95,3%



LEI DE BENFORD APLICADA NO 1º DÍGITO POR ZONAS ELEITORAIS PARA PRESIDENTE - POR UF

UF **DF**
CANDIDATO **JAIR BOLSONARO**

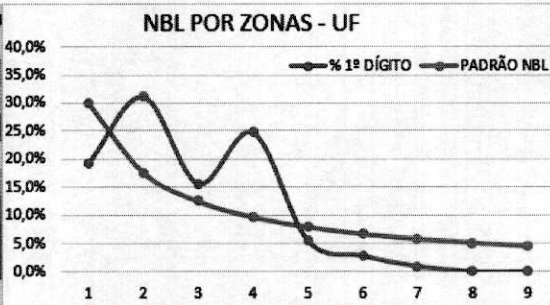
DÍGITO	TOTAL VOTOS	NBL1º	% 1º DÍGITO	PADRÃO NBL	VARIAÇÃO
1	0	0	0,0%	30,1%	-100,0%
2	28.290	1	5,3%	17,6%	-70,1%
3	132.573	4	21,1%	12,5%	68,6%
4	232.124	5	26,3%	9,7%	171,6%
5	323.115	6	31,6%	7,9%	298,7%
6	194.295	3	15,8%	6,7%	136,0%
7	0	0	0,0%	5,8%	-100,0%
8	0	0	0,0%	5,1%	-100,0%
9	0	0	0,0%	4,6%	-100,0%
Total Geral	910.397	19	100,0%	100,0%	129,7%



LEI DE BENFORD APLICADA NO 1º DÍGITO POR ZONAS ELEITORAIS PARA PRESIDENTE - POR UF

UF **CE**
CANDIDATO **LULA**

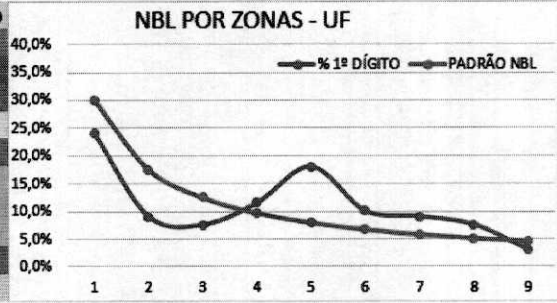
DÍGITO	TOTAL VOTOS	NBL1º	% 1º DÍGITO	PADRÃO NBL	VARIAÇÃO
1	346.705	21	19,3%	30,1%	-36,0%
2	836.121	34	31,2%	17,6%	77,1%
3	604.237	17	15,6%	12,5%	24,9%
4	1.211.873	27	24,8%	9,7%	155,6%
5	309.723	6	5,5%	7,9%	-30,5%
6	195.459	3	2,8%	6,7%	-58,9%
7	74.237	1	0,9%	5,8%	-84,2%
8	0	0	0,0%	5,1%	-100,0%
9	0	0	0,0%	4,6%	-100,0%
Total Geral	3.578.355	109	100,0%	100,0%	68,5%



LEI DE BENFORD APLICADA NO 1º DÍGITO POR ZONAS ELEITORAIS PARA PRESIDENTE - POR UF

UF **BA**
 CANDIDATO **JAIR BOLSONARO**

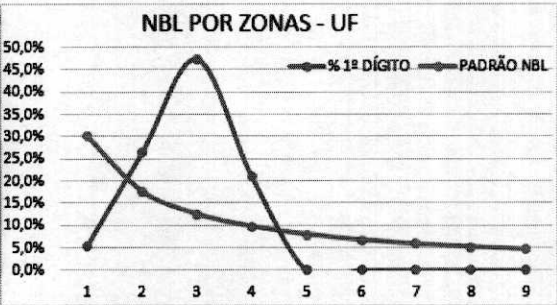
DÍGITO	TOTAL VOTOS	NBL1º	% 1º DÍGITO	PADRÃO NBL	VARIÇÃO
1	735.732	48	24,1%	30,1%	-19,9%
2	334.500	18	9,0%	17,6%	-48,6%
3	228.035	15	7,5%	12,5%	-39,7%
4	103.120	23	11,6%	9,7%	19,3%
5	197.271	36	18,1%	7,9%	128,4%
6	128.393	20	10,1%	6,7%	50,2%
7	135.615	18	9,0%	5,8%	56,0%
8	128.804	15	7,5%	5,1%	47,2%
9	56.129	6	3,0%	4,6%	-34,2%
Total Geral	2.047.599	199	100,0%	100,0%	47,3%



LEI DE BENFORD APLICADA NO 1º DÍGITO POR ZONAS ELEITORAIS PARA PRESIDENTE - POR UF

UF **DF**
 CANDIDATO **LULA**

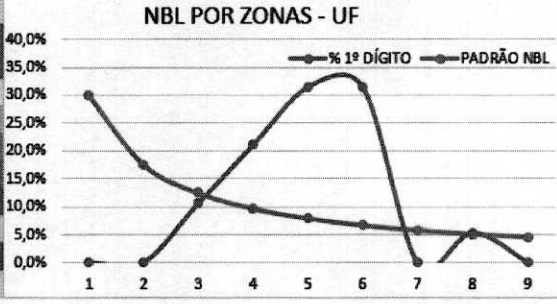
DÍGITO	TOTAL VOTOS	NBL1º	% 1º DÍGITO	PADRÃO NBL	VARIÇÃO
1	19.602	1	5,3%	30,1%	-82,5%
2	128.291	5	26,3%	17,6%	49,4%
3	330.102	9	47,4%	12,5%	279,3%
4	171.539	4	21,1%	9,7%	117,3%
5	0	0	0,0%	7,9%	-100,0%
6	0	0	0,0%	6,7%	-100,0%
7	0	0	0,0%	5,8%	-100,0%
8	0	0	0,0%	5,1%	-100,0%
9	0	0	0,0%	4,6%	-100,0%
Total Geral	649.534	19	100,0%	100,0%	109,2%



LEI DE BENFORD APLICADA NO 1º DÍGITO POR ZONAS ELEITORAIS PARA PRESIDENTE - POR UF

UF **DF**
 CANDIDATO **SIMONE TEBET**

DÍGITO	TOTAL VOTOS	NBL1º	% 1º DÍGITO	PADRÃO NBL	VARIÇÃO
1	0	0	0,0%	30,1%	-100,0%
2	0	0	0,0%	17,6%	-100,0%
3	6.771	2	10,5%	12,5%	-15,7%
4	18.757	4	21,1%	9,7%	117,3%
5	32.942	6	31,6%	7,9%	298,7%
6	38.634	6	31,6%	6,7%	372,0%
7	0	0	0,0%	5,8%	-100,0%
8	8.273	1	5,3%	5,1%	2,8%
9	0	0	0,0%	4,6%	-100,0%
Total Geral	105.377	19	100,0%	100,0%	147,3%



Similarly to the isolated state-level data from DF, AC, BA, and CE, states also show anomaly identification in the detected groups records.

Considering the short time between the expedition of the definitive results and the analysis, it is evident the need to unfold these referenced foci as a particularized observation point.

If it were the case of a specific document audit [the primary purpose of Benford's Law, i.e., to ***select indicative focuses*** and to ***conduct a document audit***], these would be the first round of specific document audits potential focuses. This is not possible in the current Brazilian electoral model, considering the inexistence of a documental collection that could elide the doubts pointed out by Benford's examination in these foci.

We present below all the data tables referring to the votes obtained by the 4 most voted candidates, with the tabulations referring to blank and spoiled votes, in the following order:

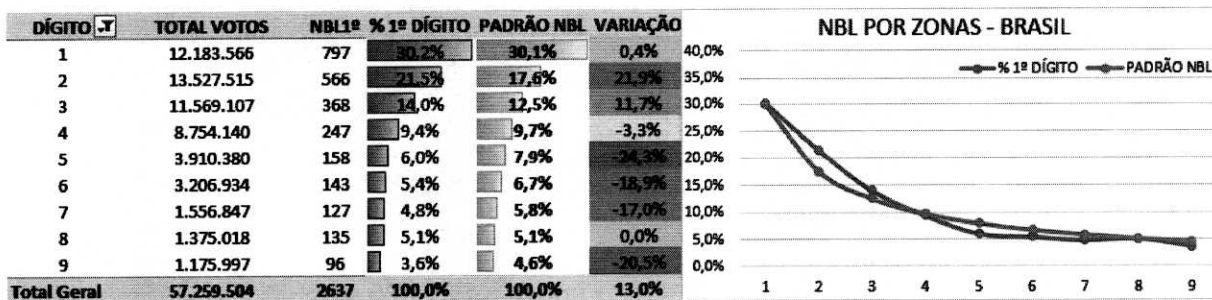
- a) National Quantitative;
- b) Regional Quantitative.

A total of 36 graphical data views regarding the LNB analysis in the 1st digit are presented below.

First, the national data aggregated by the first digit:

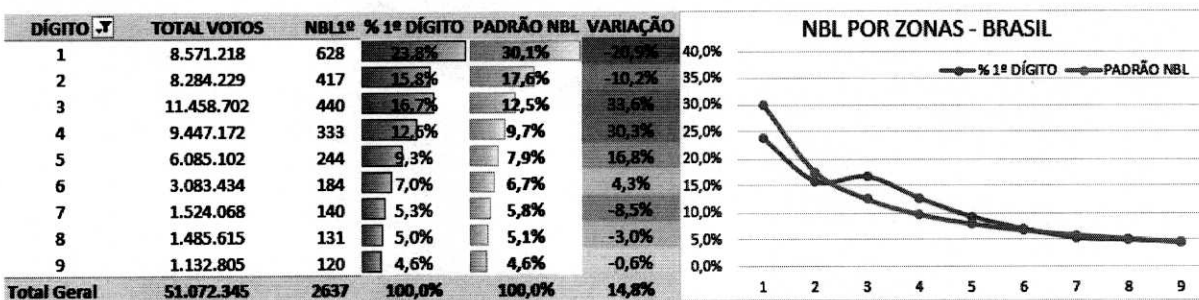
LEI DE BENFORD APLICADA NO 1º DÍGITO POR ZONAS ELEITORAIS PARA PRESIDENTE - BRASIL E EXTERIOR

CANDIDATO LULA



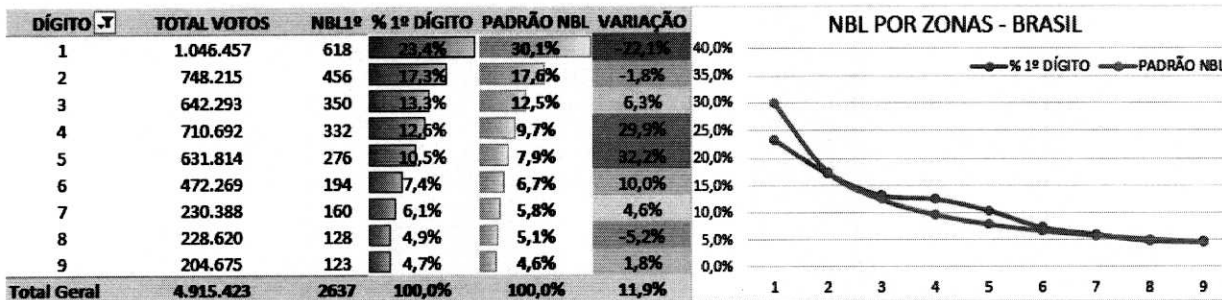
LEI DE BENFORD APLICADA NO 1º DÍGITO POR ZONAS ELEITORAIS PARA PRESIDENTE - BRASIL E EXTERIOR

CANDIDATO JAIR BOLSONARO



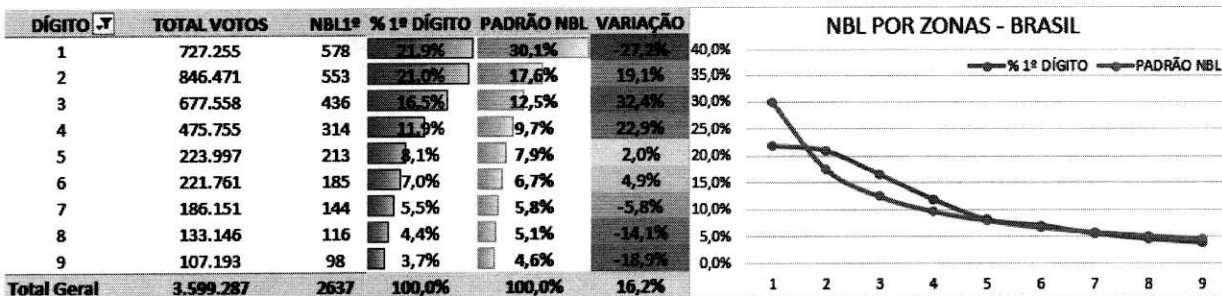
LEI DE BENFORD APLICADA NO 1º DÍGITO POR ZONAS ELEITORAIS PARA PRESIDENTE - BRASIL E EXTERIOR

CANDIDATO SIMONE TEBET



LEI DE BENFORD APLICADA NO 1º DÍGITO POR ZONAS ELEITORAIS PARA PRESIDENTE - BRASIL E EXTERIOR

CANDIDATO CIRO GOMES



LEI DE BENFORD APLICADA NO 1º DÍGITO POR ZONAS ELEITORAIS PARA PRESIDENTE - BRASIL E EXTERIOR

CANDIDATO Branco

DÍGITO	TOTAL VOTOS	NBL1º	% 1º DÍGITO	PADRÃO NBL	VARIÇÃO
1	863.384	931	35,3%	30,1%	17,3%
2	333.921	464	17,6%	17,6%	-0,1%
3	186.305	311	11,8%	12,5%	-5,6%
4	113.393	221	8,4%	9,7%	-13,5%
5	107.642	193	7,3%	7,9%	-7,6%
6	87.162	144	5,5%	6,7%	-18,4%
7	97.943	145	5,5%	5,8%	-5,2%
8	97.087	126	4,8%	5,1%	-6,7%
9	77.942	102	3,9%	4,6%	-15,5%
Total Geral	1.964.779	2637	100,0%	100,0%	6,9%



LEI DE BENFORD APLICADA NO 1º DÍGITO POR ZONAS ELEITORAIS PARA PRESIDENTE - BRASIL E EXTERIOR

CANDIDATO Nulo

DÍGITO	TOTAL VOTOS	NBL1º	% 1º DÍGITO	PADRÃO NBL	VARIÇÃO
1	1.053.561	798	30,3%	30,1%	0,5%
2	833.892	492	18,7%	17,6%	5,9%
3	503.313	300	11,4%	12,5%	-8,9%
4	329.045	277	10,5%	9,7%	8,4%
5	219.943	222	8,4%	7,9%	6,3%
6	171.073	184	7,0%	6,7%	4,3%
7	128.148	129	4,9%	5,8%	-15,7%
8	118.642	125	4,7%	5,1%	-7,4%
9	130.257	110	4,2%	4,6%	-8,9%
Total Geral	3.487.874	2637	100,0%	100,0%	7,6%



Here the data by region:

LEI DE BENFORD APLICADA NO 1º DÍGITO POR ZONAS ELEITORAIS PARA PRESIDENTE - REGIÃO NORDESTE

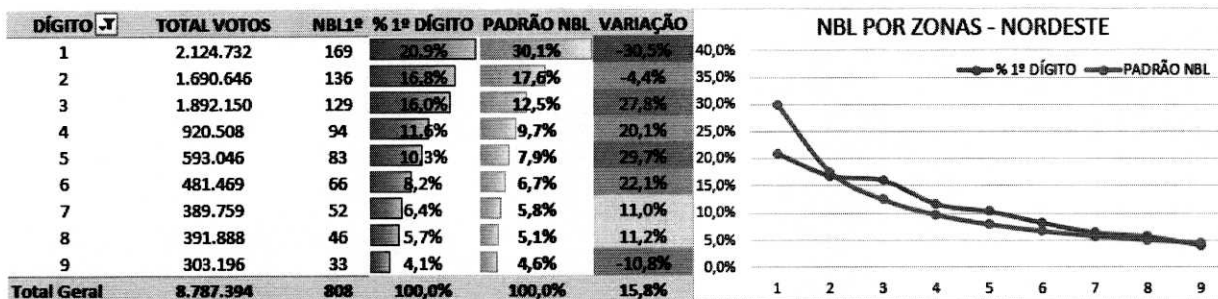
CANDIDATO LULA

DÍGITO	TOTAL VOTOS	NBL1º	% 1º DÍGITO	PADRÃO NBL	VARIÇÃO
1	4.480.557	287	35,5%	30,1%	18,0%
2	5.934.409	246	30,4%	17,6%	72,9%
3	3.872.044	113	14,0%	12,5%	12,0%
4	3.965.544	88	10,9%	9,7%	12,4%
5	1.819.159	35	4,3%	7,9%	-45,3%
6	1.398.930	22	2,7%	6,7%	-59,3%
7	163.823	4	0,5%	5,8%	-91,5%
8	60.431	7	0,9%	5,1%	-83,1%
9	58.242	6	0,7%	4,6%	-83,8%
Total Geral	21.753.139	808	100,0%	100,0%	50,1%



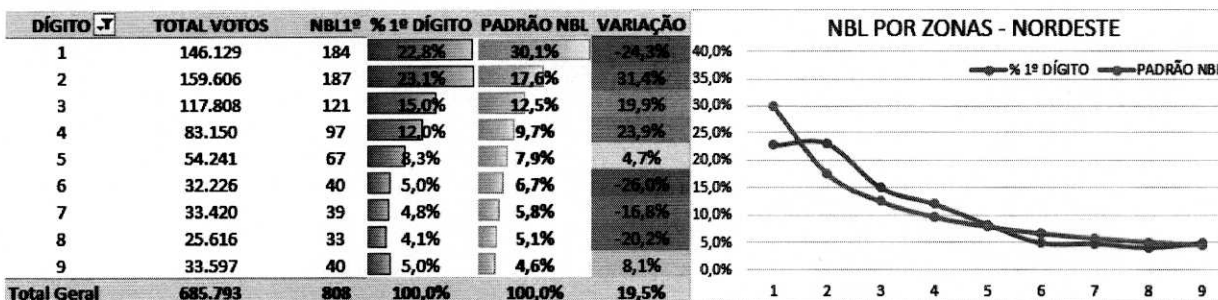
LEI DE BENFORD APLICADA NO 1º DÍGITO POR ZONAS ELEITORAIS PARA PRESIDENTE - REGIÃO NORDESTE

CANDIDATO JAIR BOLSONARO



LEI DE BENFORD APLICADA NO 1º DÍGITO POR ZONAS ELEITORAIS PARA PRESIDENTE - REGIÃO NORDESTE

CANDIDATO SIMONE TEBET



LEI DE BENFORD APLICADA NO 1º DÍGITO POR ZONAS ELEITORAIS PARA PRESIDENTE - REGIÃO NORDESTE

CANDIDATO Branco



LEI DE BENFORD APLICADA NO 1º DÍGITO POR ZONAS ELEITORAIS PARA PRESIDENTE - REGIÃO NORDESTE

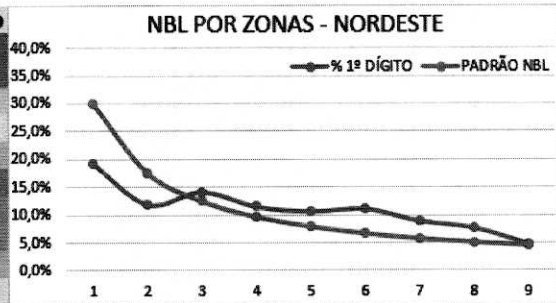
CANDIDATO Nulo



LEI DE BENFORD APLICADA NO 1º DÍGITO POR ZONAS ELEITORAIS PARA PRESIDENTE - REGIÃO NORDESTE

CANDIDATO CIRO GOMES

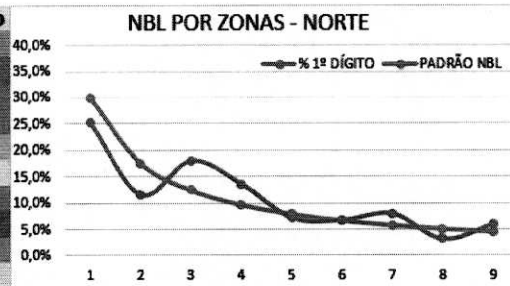
DÍGITO	TOTAL VOTOS	NBL1º	% 1º DÍGITO	PADRÃO NBL	VARIÇÃO
1	227.754	156	19,3%	30,1%	-35,9%
2	180.465	96	11,9%	17,6%	-32,5%
3	187.234	114	14,1%	12,5%	13,0%
4	112.022	93	11,5%	9,7%	18,8%
5	71.935	86	10,6%	7,9%	34,4%
6	81.767	90	11,1%	6,7%	65,5%
7	114.405	72	8,9%	5,8%	53,6%
8	74.647	62	7,7%	5,1%	49,9%
9	53.402	39	4,8%	4,6%	5,4%
Total Geral	1.103.631	808	100,0%	100,0%	28,3%



LEI DE BENFORD APLICADA NO 1º DÍGITO POR ZONAS ELEITORAIS PARA PRESIDENTE - REGIÃO NORTE

CANDIDATO JAIR BOLSONARO

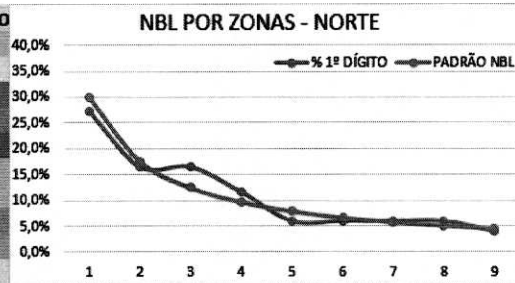
DÍGITO	TOTAL VOTOS	NBL1º	% 1º DÍGITO	PADRÃO NBL	VARIÇÃO
1	748.943	63	25,3%	30,1%	-15,9%
2	471.001	29	11,6%	17,6%	-33,9%
3	862.624	45	18,1%	12,5%	44,7%
4	789.233	34	13,7%	9,7%	40,9%
5	590.606	18	7,2%	7,9%	-8,7%
6	287.284	17	6,8%	6,7%	2,1%
7	356.009	20	8,0%	5,8%	38,3%
8	147.553	8	3,2%	5,1%	-37,2%
9	142.908	15	6,0%	4,6%	31,5%
Total Geral	4.396.161	249	100,0%	100,0%	28,5%



LEI DE BENFORD APLICADA NO 1º DÍGITO POR ZONAS ELEITORAIS PARA PRESIDENTE - REGIÃO NORTE

CANDIDATO LULA

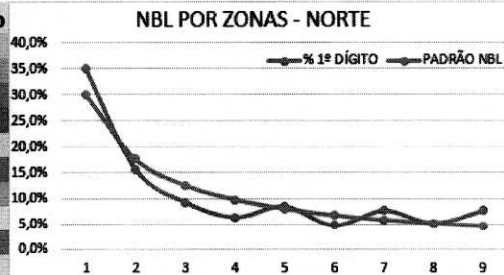
DÍGITO	TOTAL VOTOS	NBL1º	% 1º DÍGITO	PADRÃO NBL	VARIÇÃO
1	950.884	68	27,3%	30,1%	-9,3%
2	948.658	41	16,5%	17,6%	-6,5%
3	1.028.461	41	16,5%	12,5%	31,8%
4	675.559	29	11,6%	9,7%	20,2%
5	230.256	15	6,0%	7,9%	-23,9%
6	320.391	15	6,0%	6,7%	-10,0%
7	177.425	15	6,0%	5,8%	3,9%
8	127.605	15	6,0%	5,1%	17,7%
9	95.391	10	4,0%	4,6%	-12,3%
Total Geral	4.554.630	249	100,0%	100,0%	15,2%



LEI DE BENFORD APLICADA NO 1º DÍGITO POR ZONAS ELEITORAIS PARA PRESIDENTE - REGIÃO NORTE

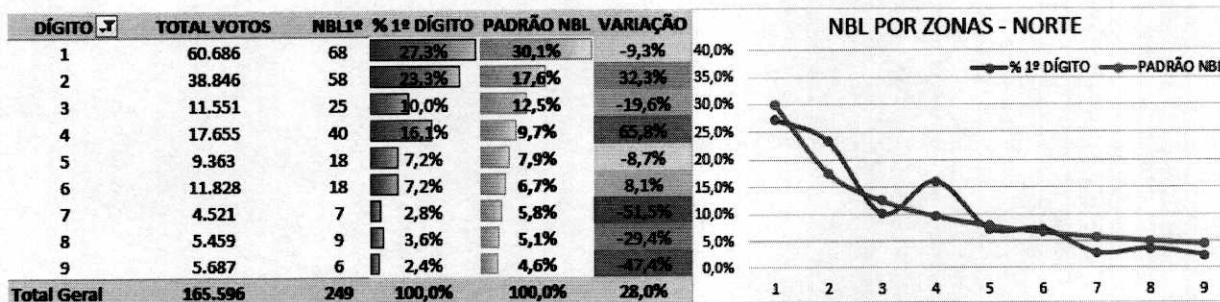
CANDIDATO Branco

DÍGITO	TOTAL VOTOS	NBL1º	% 1º DÍGITO	PADRÃO NBL	VARIÇÃO
1	39.169	87	24,9%	30,1%	-16,1%
2	8.259	39	13,7%	17,6%	-11,1%
3	4.470	23	9,2%	12,5%	-26,0%
4	4.300	16	6,4%	9,7%	-33,7%
5	5.118	21	8,4%	7,9%	6,5%
6	4.408	12	4,8%	6,7%	-28,0%
7	7.516	19	7,6%	5,8%	31,6%
8	4.840	13	5,2%	5,1%	2,0%
9	8.745	19	7,6%	4,6%	66,0%
Total Geral	86.825	249	100,0%	100,0%	24,5%



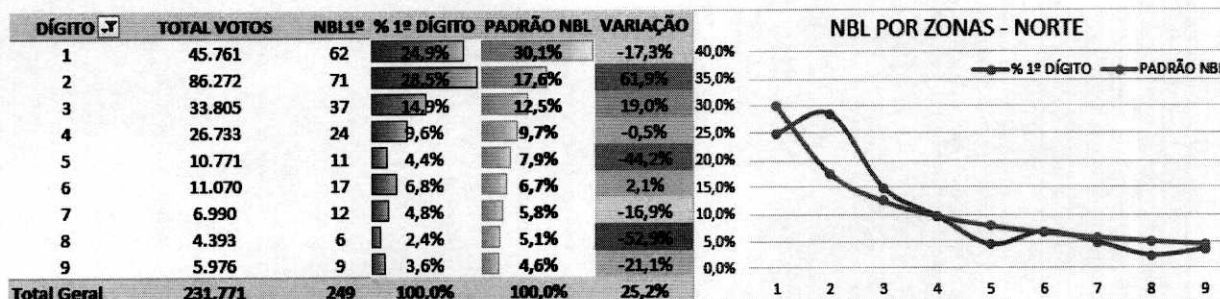
LEI DE BENFORD APLICADA NO 1º DÍGITO POR ZONAS ELEITORAIS PARA PRESIDENTE - REGIÃO NORTE

CANDIDATO **NULO**



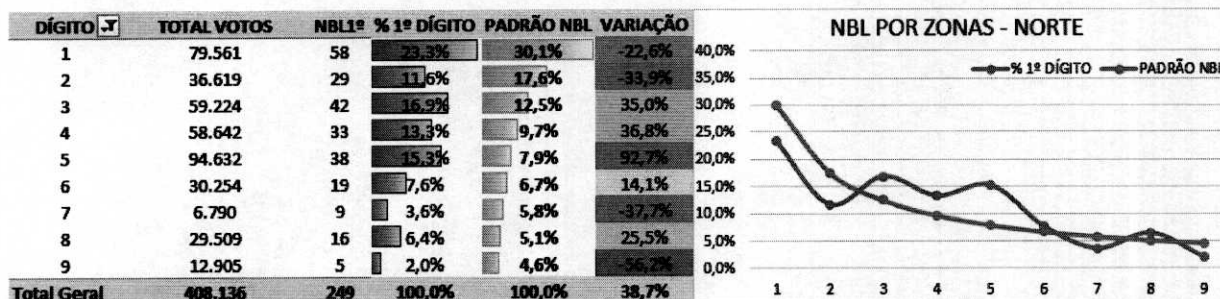
LEI DE BENFORD APLICADA NO 1º DÍGITO POR ZONAS ELEITORAIS PARA PRESIDENTE - REGIÃO NORTE

CANDIDATO **CIRO GOMES**



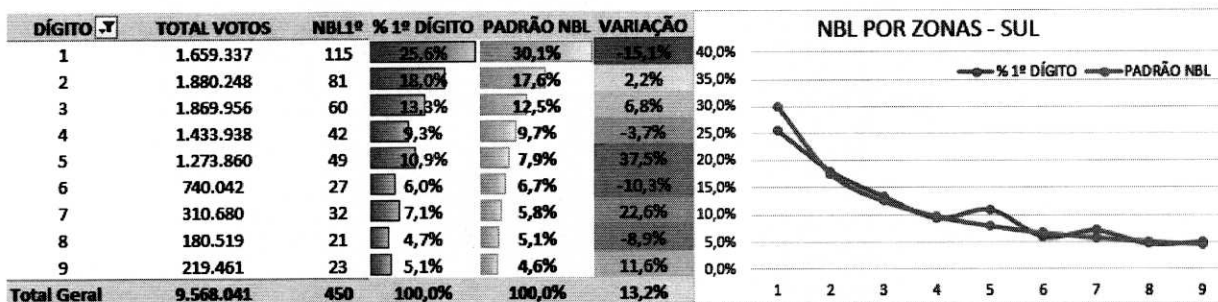
LEI DE BENFORD APLICADA NO 1º DÍGITO POR ZONAS ELEITORAIS PARA PRESIDENTE - REGIÃO NORTE

CANDIDATO **SIMONE TEBET**



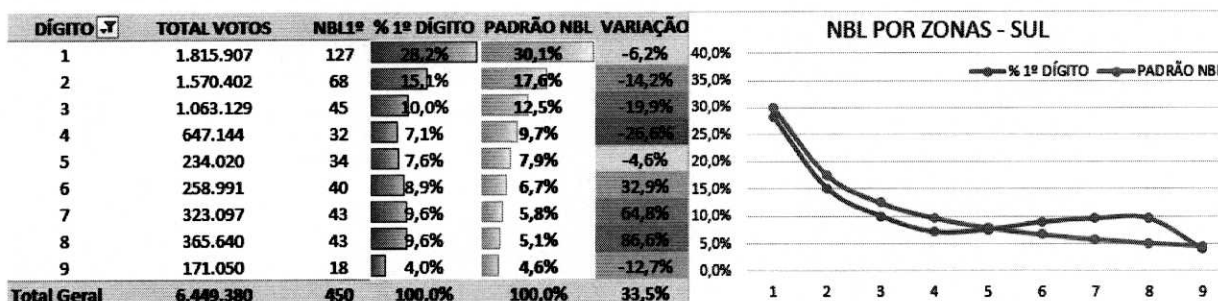
LEI DE BENFORD APLICADA NO 1º DÍGITO POR ZONAS ELEITORAIS PARA PRESIDENTE - REGIÃO SUL

CANDIDATO JAIR BOLSONARO



LEI DE BENFORD APLICADA NO 1º DÍGITO POR ZONAS ELEITORAIS PARA PRESIDENTE - REGIÃO SUL

CANDIDATO LULA



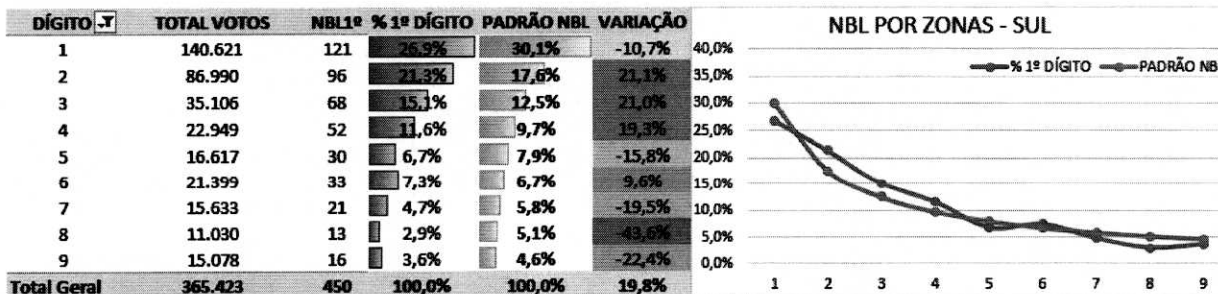
LEI DE BENFORD APLICADA NO 1º DÍGITO POR ZONAS ELEITORAIS PARA PRESIDENTE - REGIÃO SUL

CANDIDATO Branco



LEI DE BENFORD APLICADA NO 1º DÍGITO POR ZONAS ELEITORAIS PARA PRESIDENTE - REGIÃO SUL

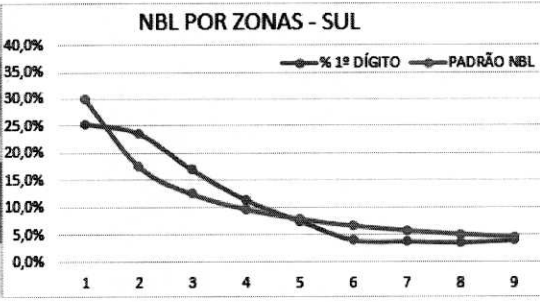
CANDIDATO NULO



LEI DE BENFORD APLICADA NO 1º DÍGITO POR ZONAS ELEITORAIS PARA PRESIDENTE - REGIÃO SUL

CANDIDATO CIRO GOMES

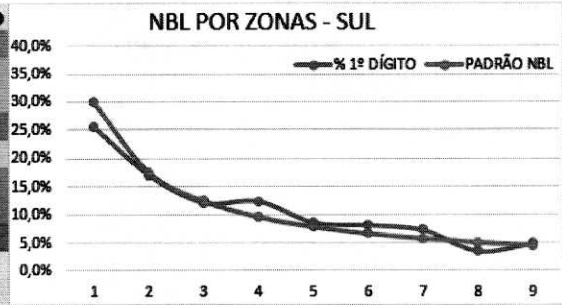
DÍGITO	TOTAL VOTOS	NBL1º	% 1º DÍGITO	PADRÃO NBL	VARIAÇÃO
1	123.664	114	25,3%	30,1%	-15,8%
2	126.569	106	23,6%	17,6%	33,6%
3	75.483	76	16,9%	12,5%	35,2%
4	51.744	51	11,3%	9,7%	17,0%
5	28.250	34	7,6%	7,9%	-4,6%
6	11.797	18	4,0%	6,7%	-40,2%
7	12.656	17	3,8%	5,8%	-34,9%
8	13.019	16	3,6%	5,1%	-30,6%
9	17.034	18	4,0%	4,6%	-12,7%
Total Geral	460.216	450	100,0%	100,0%	23,3%



LEI DE BENFORD APLICADA NO 1º DÍGITO POR ZONAS ELEITORAIS PARA PRESIDENTE - REGIÃO SUL

CANDIDATO SIMONE TEBET

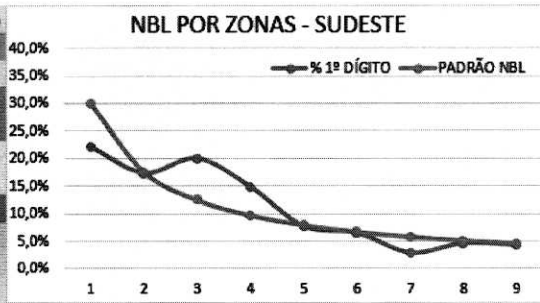
DÍGITO	TOTAL VOTOS	NBL1º	% 1º DÍGITO	PADRÃO NBL	VARIAÇÃO
1	158.709	115	25,6%	30,1%	-15,1%
2	166.055	77	17,1%	17,6%	-2,8%
3	116.593	55	12,2%	12,5%	-2,1%
4	130.147	56	12,4%	9,7%	28,4%
5	75.460	39	8,7%	7,9%	9,4%
6	65.659	37	8,2%	6,7%	22,9%
7	38.175	33	7,3%	5,8%	25,4%
8	13.540	16	3,6%	5,1%	-30,6%
9	54.614	22	4,9%	4,6%	6,7%
Total Geral	818.952	450	100,0%	100,0%	15,5%



LEI DE BENFORD APLICADA NO 1º DÍGITO POR ZONAS ELEITORAIS PARA PRESIDENTE - REGIÃO SUDESTE

CANDIDATO JAIR BOLSONARO

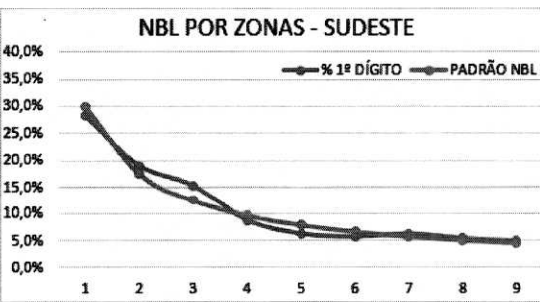
DÍGITO	TOTAL VOTOS	NBL1º	% 1º DÍGITO	PADRÃO NBL	VARIAÇÃO
1	2.831.603	201	22,0%	30,1%	-26,8%
2	3.955.308	158	17,3%	17,6%	-1,6%
3	6.068.833	182	20,0%	12,5%	59,8%
4	5.170.173	135	14,8%	9,7%	52,8%
5	2.728.932	70	7,7%	7,9%	-3,1%
6	1.301.757	59	6,5%	6,7%	-3,3%
7	393.510	26	2,9%	5,8%	-50,8%
8	647.974	42	4,6%	5,1%	-10,1%
9	372.439	39	4,3%	4,6%	-6,6%
Total Geral	23.470.529	912	100,0%	100,0%	24,5%



LEI DE BENFORD APLICADA NO 1º DÍGITO POR ZONAS ELEITORAIS PARA PRESIDENTE - REGIÃO SUDESTE

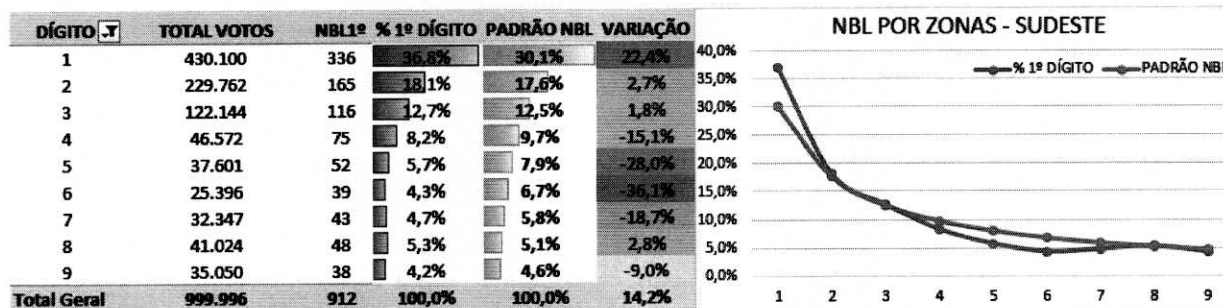
CANDIDATO LULA

DÍGITO	TOTAL VOTOS	NBL1º	% 1º DÍGITO	PADRÃO NBL	VARIAÇÃO
1	4.048.579	258	28,3%	30,1%	-6,0%
2	4.215.582	174	19,1%	17,6%	8,3%
3	4.736.655	140	15,4%	12,5%	22,9%
4	3.195.738	80	8,8%	9,7%	-9,5%
5	1.535.919	57	6,3%	7,9%	-21,1%
6	1.137.808	52	5,7%	6,7%	-14,8%
7	834.098	57	6,3%	5,8%	7,8%
8	643.416	49	5,4%	5,1%	4,9%
9	689.299	45	4,9%	4,6%	7,7%
Total Geral	21.037.094	912	100,0%	100,0%	11,4%



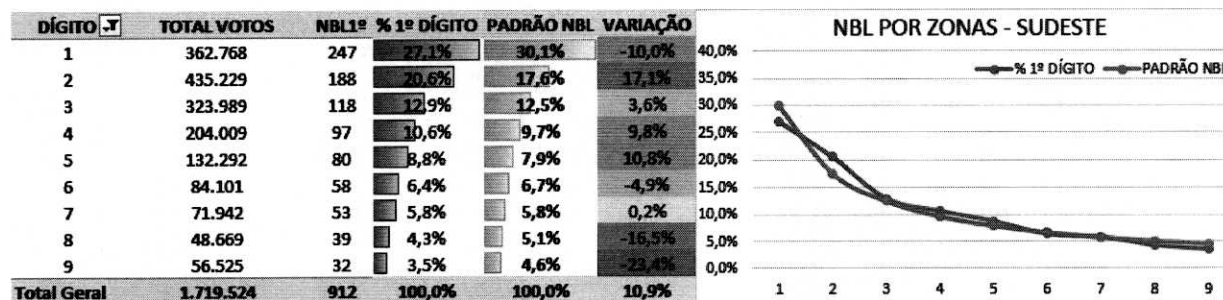
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CANDIDATO Branco



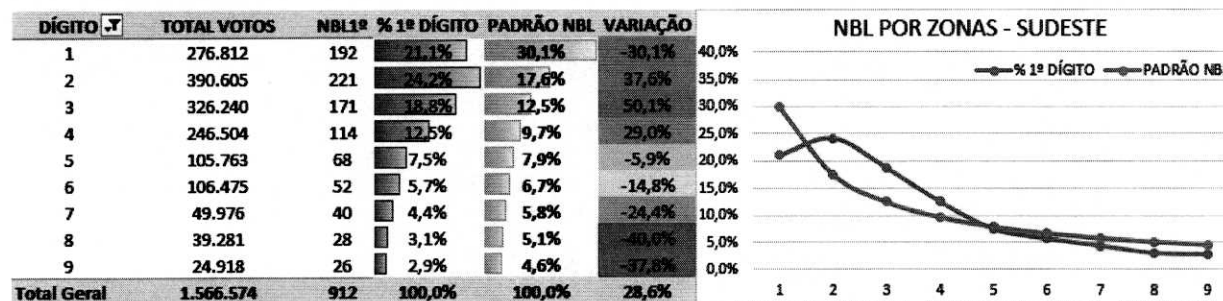
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CANDIDATO Nulo



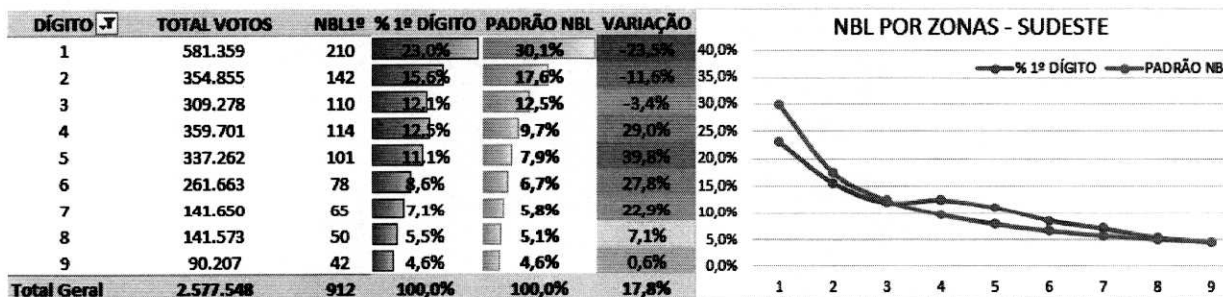
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CANDIDATO CIRO GOMES



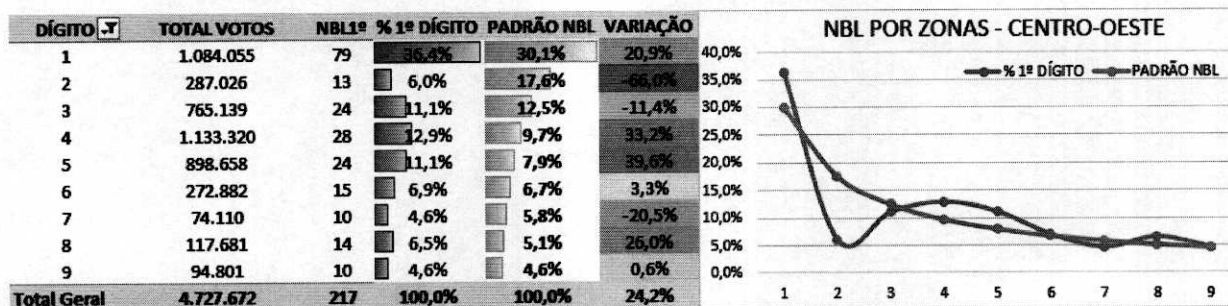
LEI DE BENFORD APLICADA NO 1º DÍGITO POR ZONAS ELEITORAIS PARA PRESIDENTE - REGIÃO SUDESTE

CANDIDATO SIMONE TEBET



LEI DE BENFORD APLICADA NO 1º DÍGITO POR ZONAS ELEITORAIS PARA PRESIDENTE - REGIÃO CENTRO-OESTE

CANDIDATO JAIR BOLSONARO



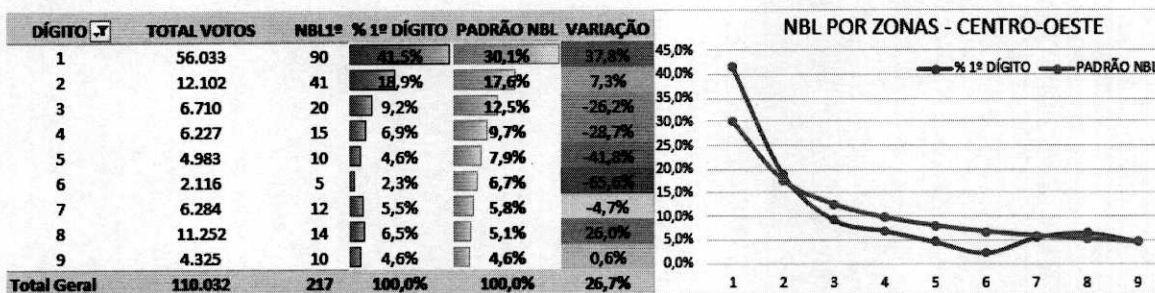
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CANDIDATO LULA



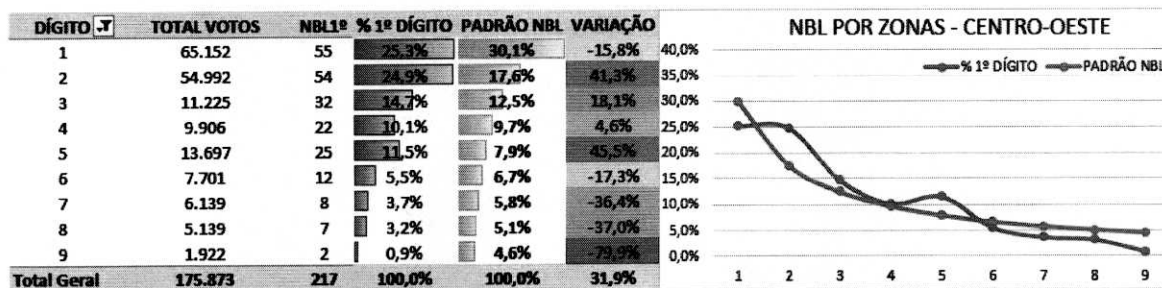
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CANDIDATO Branco



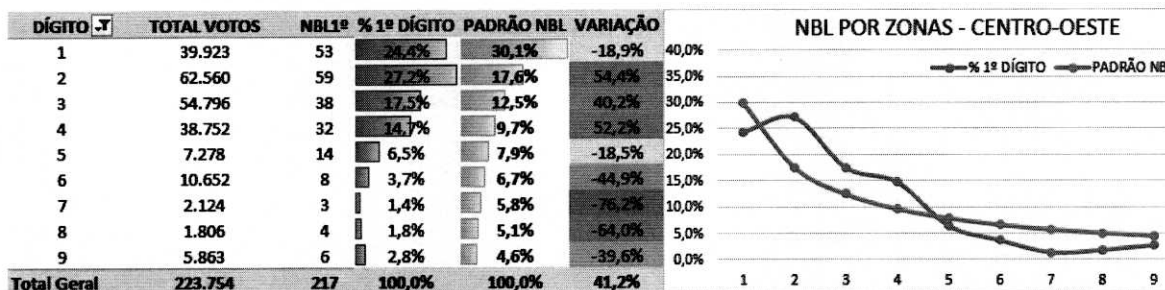
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CANDIDATO **NULO**



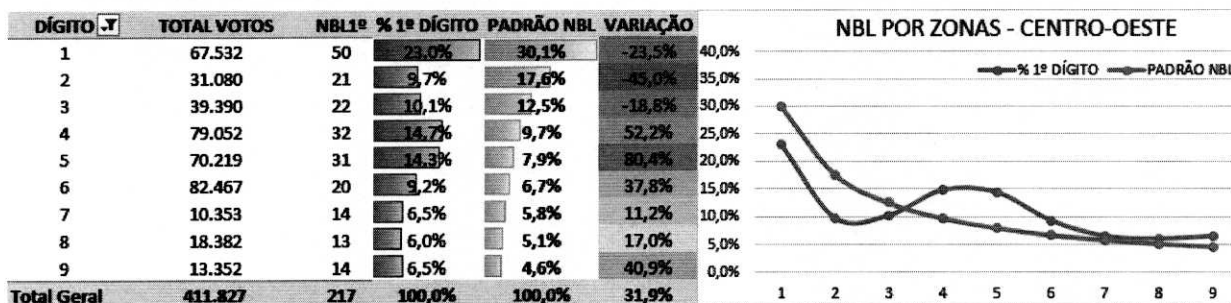
LEI DE BENFORD APLICADA NO 1º DÍGITO POR ZONAS ELEITORAIS PARA PRESIDENTE - REGIÃO CENTRO-OESTE

CANDIDATO **CIRO GOMES**



LEI DE BENFORD APLICADA NO 1º DÍGITO POR ZONAS ELEITORAIS PARA PRESIDENTE - REGIÃO CENTRO-OESTE

CANDIDATO **SIMONE TEBET**



2ND DIGIT RULE

Another Benford Law technique used, works with the 2nd digit. The renowned researcher Walter Mebane, from University of Michigan, used this technique to evaluate the 2009 Iranian elections. Strong anomalies were found that indicated the victory of politician Ahmadinejad. In this series, the data were worked by electoral zones, considering the votes that reached more than 10 votes, in order to benefit only the 2nd digit.

The historical proportions for the second digit are as follows:

Probabilidades	0	1	2	3	4	5	6	7	8	9
1º posição	—	30.1%	17.6%	12.5%	9.7%	7.9%	6.7%	5.8%	5.1%	4.6%
2º posição	12%	11.4%	10.9%	10.4%	10%	9.7%	9.3%	9%	8.8%	8.5%
3º posição	10.2%	10.1%	10.1%	10.1%	10%	10%	9.9%	9.9%	9.9%	9.8%

In the graphs below, it is possible to see the apparent distortions occurring in the totals aggregated by Electoral Zones of the Brazilian states, later grouped by geographic region. As shown in the graphs, a data aggregate amount which analysis focuses on the second digit can present apparent distortions. These distortions should be the object of specific studies, which will be seen in subsequent data series.

The following is a group of examples in which there are regions by the second digit clustering. There are also evidence of anomalies in data distribution:

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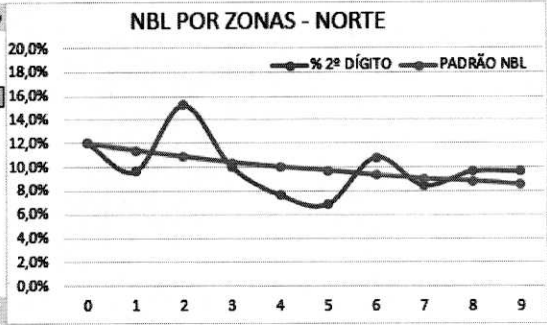
CANDIDATO JAIR BOLSONARO



LEI DE BENFORD APLICADA NO 2º DÍGITO POR ZONAS ELEITORAIS PARA PRESIDENTE - REGIÃO NORTE

CANDIDATO JAIR BOLSONARO .T

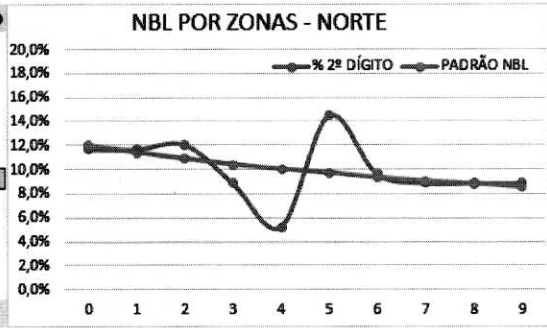
DÍGITO	TOTAL VOTOS	NBL2º	% 2º DÍGITO	PADRÃO NBL	VARIACÃO
0	343.427	30	12,0%	12,0%	0,4%
1	347.584	24	9,6%	11,4%	-5,5%
2	834.666	38	15,3%	10,9%	40,0%
3	501.349	25	10,0%	10,4%	-3,5%
4	259.173	19	7,6%	10,0%	-3,7%
5	347.277	17	6,8%	9,7%	-9,6%
6	488.889	27	10,8%	9,3%	16,0%
7	340.309	21	8,0%	9,0%	-8,3%
8	443.983	24	9,6%	8,8%	9,5%
9	489.504	24	9,6%	8,5%	13,0%
Total Geral	4.396.161	249	100,0%	100,0%	15,8%



LEI DE BENFORD APLICADA NO 2º DÍGITO POR ZONAS ELEITORAIS PARA PRESIDENTE - REGIÃO NORTE

CANDIDATO NULO .T

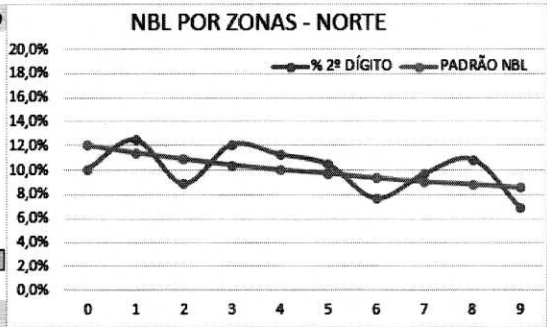
DÍGITO	TOTAL VOTOS	NBL2º	% 2º DÍGITO	PADRÃO NBL	VARIACÃO
0	18.325	29	11,6%	12,0%	-2,9%
1	22.981	29	11,6%	11,4%	2,1%
2	17.580	30	12,0%	10,9%	10,8%
3	11.615	22	8,8%	10,4%	-16,0%
4	8.085	13	5,2%	10,0%	-48,0%
5	28.118	36	14,5%	9,7%	49,2%
6	18.421	24	9,6%	9,3%	3,0%
7	11.259	22	8,8%	9,0%	-1,8%
8	9.563	22	8,8%	8,8%	0,4%
9	19.649	22	8,8%	8,5%	3,4%
Total Geral	165.596	249	100,0%	100,0%	13,7%



LEI DE BENFORD APLICADA NO 2º DÍGITO POR ZONAS ELEITORAIS PARA PRESIDENTE - REGIÃO NORTE

CANDIDATO SIMONE TEBET .T

DÍGITO	TOTAL VOTOS	NBL2º	% 2º DÍGITO	PADRÃO NBL	VARIACÃO
0	49.254	25	10,0%	12,0%	-18,3%
1	39.637	31	12,4%	11,4%	9,2%
2	25.607	22	8,8%	10,9%	-19,9%
3	44.260	30	12,0%	10,4%	15,0%
4	45.516	28	11,2%	10,0%	12,0%
5	59.111	26	10,4%	9,7%	7,8%
6	32.853	19	7,6%	9,3%	-18,0%
7	33.801	24	8,6%	9,0%	-7,8%
8	55.353	27	10,8%	8,8%	23,0%
9	22.744	17	6,8%	8,5%	-19,7%
Total Geral	408.136	249	100,0%	100,0%	14,8%



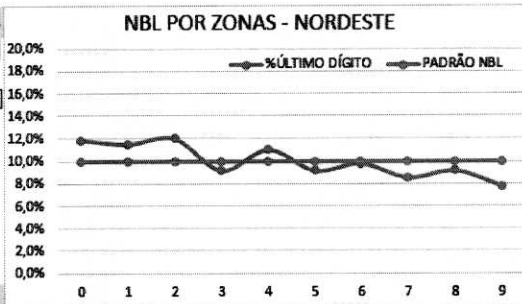
These 4 graphs present - all of them - show an average variation index higher than 10%.

Regarding the last digit analysis, we have a straight line, with the inversion of the parameters, instead of a descending curve with the ideal values of Benford's Law. There is a lot of data and graphs of the entire electoral universal data from all over the country. As an example and indicative element, we bring some graphs described below:

LEI DE BENFORD APLICADA NO ÚLTIMO DÍGITO POR ZONAS ELEITORAIS PARA PRESIDENTE - REGIÃO NORDESTE

CANDIDATO Branco

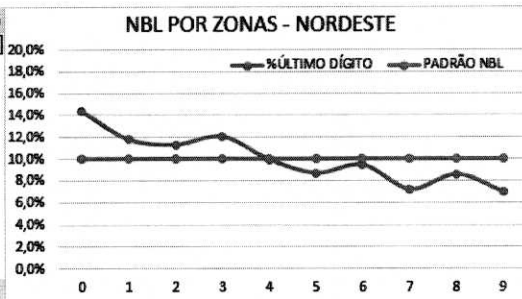
DÍGITO	TOTAL VOTOS	NBL ÚLTIMO	%ÚLTIMO DÍGITO	PADRÃO NBL	VARIÇÃO
0	59.826	96	11,9%	10,0%	18,8%
1	55.919	93	11,5%	10,0%	15,8%
2	58.569	97	12,0%	10,0%	20,0%
3	37.437	74	9,2%	10,0%	-8,0%
4	51.556	89	11,0%	10,0%	10,0%
5	36.316	74	9,2%	10,0%	-8,0%
6	44.404	79	9,8%	10,0%	-2,2%
7	34.553	69	8,5%	10,0%	-14,6%
8	42.095	74	9,2%	10,0%	-8,0%
9	37.284	63	7,8%	10,0%	-22,0%
Total Geral	457.959	808	100,0%	100,0%	12,8%



LEI DE BENFORD APLICADA NO ÚLTIMO DÍGITO POR ZONAS ELEITORAIS PARA PRESIDENTE - REGIÃO NORDESTE

CANDIDATO Nulo

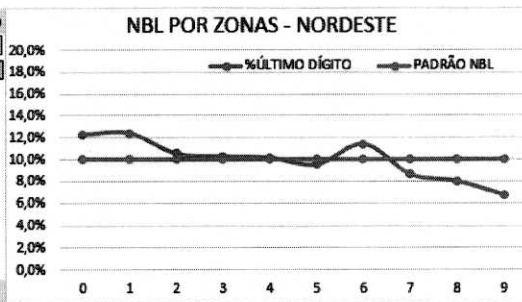
DÍGITO	TOTAL VOTOS	NBL ÚLTIMO	%ÚLTIMO DÍGITO	PADRÃO NBL	VARIÇÃO
0	135.223	116	14,4%	10,0%	43,8%
1	121.171	95	11,8%	10,0%	17,8%
2	115.197	91	11,3%	10,0%	12,8%
3	119.832	97	12,0%	10,0%	20,0%
4	114.805	80	9,9%	10,0%	-1,0%
5	96.992	70	8,7%	10,0%	-13,4%
6	108.932	76	9,4%	10,0%	-6,9%
7	72.832	58	7,7%	10,0%	-23,2%
8	98.685	69	8,5%	10,0%	-14,6%
9	73.139	56	6,9%	10,0%	-30,7%
Total Geral	1.056.808	808	100,0%	100,0%	18,8%



LEI DE BENFORD APLICADA NO ÚLTIMO DÍGITO POR ZONAS ELEITORAIS PARA PRESIDENTE - REGIÃO NORDESTE

CANDIDATO CIRO GOMES

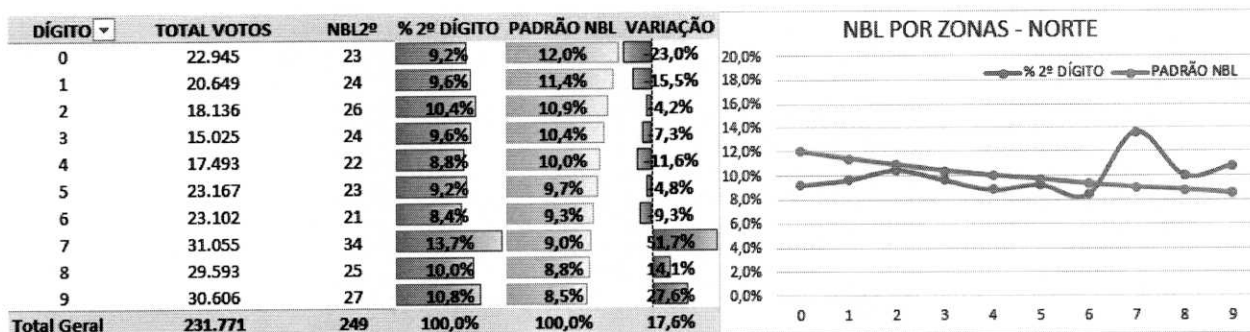
DÍGITO	TOTAL VOTOS	NBL ÚLTIMO	%ÚLTIMO DÍGITO	PADRÃO NBL	VARIÇÃO
0	120.097	99	12,3%	10,0%	22,5%
1	162.313	100	12,4%	10,0%	23,8%
2	112.846	85	10,5%	10,0%	5,2%
3	111.056	83	10,3%	10,0%	2,7%
4	119.778	82	10,1%	10,0%	1,5%
5	92.480	77	9,5%	10,0%	-4,8%
6	124.771	92	11,4%	10,0%	13,9%
7	106.066	70	8,7%	10,0%	-13,0%
8	80.953	65	8,0%	10,0%	-20,5%
9	73.271	55	6,8%	10,0%	-31,9%
Total Geral	1.103.631	808	100,0%	100,0%	13,9%



In these three numerical groups presented, there is a very interesting phenomenon from an analytical point of view. *Where there should be a line, there is a curve.*

There is another case with similar (but reversed) behavior derived from second digit data:

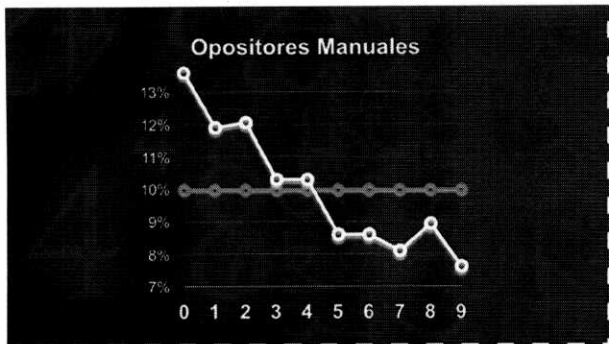
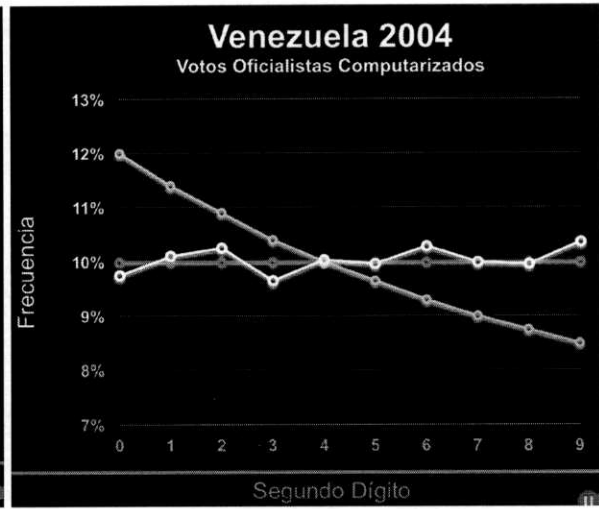
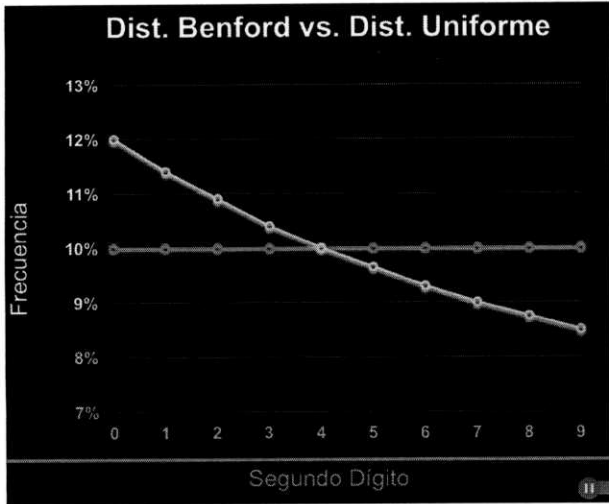
LEI DE BENFORD APLICADA NO 2º DÍGITO POR ZONAS ELEITORAIS PARA PRESIDENTE - REGIÃO NORTE
CANDIDATO CIRO GOMES



In this example, the inverse occurs. Where there should be a "descending curve", there is an "almost straight", or a slightly ascending curve. This type of situation (curves where there should be straights, or straights where there should be curves, or rising curves versus falling curves) materializes the highest level concern sign about the integrity of the data sets. This constitutes a strong indicative element.

This kind of inversion is exactly what happened in the controversial Venezuelan election of 2004. The inversion of axes occurred, which may mean that some of the number sets are not products of natural distribution, but of random number generators. The hypothesis is explained in the video documentary "El Poder de la Matemática", available on Youtube. [<https://www.youtube.com/watch?v=IZNiFCvIbP8&t=303s>]

The video is described as follows : *"May 25, 2013 Documentary showing the Enron case and the 2004 Presidential Recall Referendum in Venezuela, in which the use of mathematics, specifically Benford's Law, was used to detect fraud"*. Here are some screenshots taken directly from this documentary:



In the 7 min and 44 seconds of the video is presented the situation in which the inversion between straight lines/curves occurs (highlighted in yellow). It is observed that among the 4 numerical groups graphs where there should be a behavior adhering to Benford's patterns, this occurs only in 3 groups. One of them does not follow the Benford patterns, but rather the patterns of equitable digits distribution. This tends to be a pattern anomaly by NBL view.

This behavior [*inversion between curves and straight lines*] was identified in at least 4 situations in the 2022 First Round Brazilian presidential elections.

CONCLUSION

i) The sixth column of each table contains the percentage variation that occurred between the parameter considered "ideal" for the NBL and the actual data found. In several cells this variation had a significant amount.

ii) Obtaining the average variation of each table we have the following scenario;

ii.a) 30 times - in 30 scenarios - this difference exceeded the 10% variation mark outside the ideal NBL parameter.

ii.b) In 18 occasions this average discrepancy exceeds 20%;

ii.c) In 7 occasions it exceeds the average of 30%, 1 of them exceeds 40%, and another exceeds 50%.

iii) The comparative of items "i", "ii" e "iii" considers 30 tables (5 regions composed by the 4 most voted candidates, plus blank and null votes) referring to the 1st digit analysis;

iv) There are other types of variations that do not claim to the standards considered adequate, considering the second and last digits analysis, as well as there are specific situations of more intense aggravation (such as the cases of "zero" cells in the states mentioned). However, these data are localized and need to be examined in the context of the national data set.

v) Records found in the data sets generate the inversion between "descending curves", "straight", "ascending curves", which also occurred in the 2004 Venezuela case cited in the body of the text.

Considering the analyzed data as well as the evidential profile of Benford's Law (and not probative), the most correct procedure to be adopted in sequence should be a deep and detailed audit, with analysis and comparison of PHYSICAL DOCUMENTS against the graphic evidence identified, in order to be able to elide or confirm the detected anomalies.

Ex positis, and considering the speed and scarcity of time, it is concluded that [as in the past] there is a potential for risk of undue penetration and the realization of artificial data tampering that justifies the discrepancies found - without this being assertion constitutes, at the present time, a definitive evidence. This fact constitutes an evidentiary element and may give rise to the adoption of **EMERGENT** and **URGENT** measures regarding the preservation of **NATIONAL SOVEREIGNTY** of the Brazilian Nation in the face of possible international interests. It is necessary to guarantee the complete independence of the results for the second round, in the face of any international threat, as recorded. Such measures consist of joint and cooperative action of federative bodies, each within its own area of operation.

Obs: This document is a work in progress and will be expanded in the coming days. The accelerated way in which the study was produced and reported may lead to eventual spelling and writing inaccuracies, and it is under review immediately after its conclusion.