Memo: Analysis of ETB Theft Claims and Reimbursement Transactions

Audience: CDSS RADD Deputy Director

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Introduction:

Not unlike the diverse array of residents who constitute California's diffuse demographics, the standard deviation of an aggregated set of values can be measured by assessing the variations that exist within the individuality of the numbers themselves. These variations reflect the degree of inconsistency within the dataset, much like the daily stretching or squeezing of the economic realities faced by low-income beneficiaries of the CDSS Electronic Benefits System. Beneath this well-established distribution of general welfare lies a 21st-century cyber network of criminals who not only pilfer funds from the coffers of the Department of Social Services but also undermine the goodwill of California taxpayers. In this analysis, I am pleased to present the findings of my research on the volume and value of theft claims, as well as reimbursements, before and after the policy change implemented on January 27, 2023. The aim of this analysis is to provide insights into the monetary aspects of theft claims and reimbursements and shed light on the impact of the policy change.

Assumptions and Limitations of the Data:

When working with data and conducting data analysis, it is crucial to consider the assumptions and limitations inherent in the datasets. The raw claims file, with 345,587 observations, and the raw reimbursements file, with 120,020 observations, provide valuable insights, but it is important to acknowledge their limitations. These datasets represent a subset of the overall population and may not capture every possible scenario. Additionally, the data's accuracy, completeness, and reliability can impact the analysis outcomes, and it highlights the importance of the data's volume, value, variety, velocity, and veracity. Data cleaning and preprocessing steps were undertaken to address these factors, but it is essential to interpret the results with an understanding of the assumptions and limitations associated with this particular dataset.

Methodology:

The analysis involved a comprehensive approach that utilized various data analytical tools and methodologies to ensure accurate and meaningful insights. The following tools were employed: Google Colab, Jupyter Notebook, MySQL, and Excel. Each tool served a specific purpose in the analysis workflow.

Google Colab, with its collaborative capabilities and powerful libraries, provided an ideal environment for data exploration, cleaning, preprocessing, and visualization. It facilitated the examination of data distributions through histograms and boxplots, allowing for the identification of outliers using the 1.5*IQR rule.

MySQL, a widely adopted relational database management system, was utilized for executing queries and extracting relevant data for analysis. Its efficient querying capabilities enabled the retrieval of specific data based on defined criteria, enhancing the precision of the analysis.

Excel, a versatile spreadsheet tool, played a vital role in exploring the raw data types and handling .csv files. It offered flexibility in saving and reading data files, contributing to the seamless integration of data processing steps.

The methodology for this analysis comprised two essential steps: Data Cleaning and Preprocessing, and Exploratory Data Analysis. During the Data Cleaning and Preprocessing phase, the raw dataset underwent a comprehensive series of procedures to ensure its suitability for analysis and future machine learning modeling. This phase involved assessing the shape of the dataset and optimizing data types to improve memory usage. Thorough attention was given to addressing missing values, eliminating duplicates, and conducting meticulous exploration of unique feature values. Outliers were handled through imputation or capping techniques, and the dataset was split based on the policy date change of January 27, 2023. Statistical summaries were computed on pre and post policy dataframes, and the datasets were standardized for compatibility with pickle files, facilitating their utilization in various supervised regression models, supervised logistic models, or unsupervised clustering algorithms. These steps played a pivotal role in enhancing data quality, accuracy, and compatibility for subsequent classification and/or predictive modelling. It is essential to emphasize that the effectiveness of these steps hinges on the quality and completeness of the original raw data. By diligently addressing challenges related to data cleaning and preprocessing, the analysis aims to generate reliable and robust insights that will form the basis for informed decision-making processes.

Results:

Finding 1:

TOTAL CLAIMS (raw datasets):

The total value of claims reported before the policy change (pre-policy) was \$91,512,819.47 The total value of claims reported after the policy change (post-policy) was \$14,669,931.82.

TOTAL CLAIMS (cleaned datasets):

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Total value of claims before the policy change: $ 81,374,247.18 Total value of claims after the policy change: $ 13,555,037.66
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TOTAL REIMBURSEMENTS (raw datasets):

The total value of reimbursements reported before the policy change (pre-policy) was \$48.896.250.00

The total value of reimbursements reported after the policy change (pre-policy) was \$25,368,774.00.

TOTAL REIMBURSEMENTS (cleaned datasets):

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Total value of reimbursements before the policy change: $ 48523597.35 Total value of reimbursements after the policy change: $ 25196071.60
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The analysis of the cleaned datasets reveals that the total value of claims before the policy change (prepolicy) was \$81,374,247.18, which represents a decrease of approximately 11.1% compared to the raw data. Similarly, the total value of claims after the policy change (post-policy) was \$13,555,037.66, indicating a reduction of about 7.2%.

In terms of reimbursements, the cleaned datasets show that the total value of reimbursements before the policy change was \$48,523,597.35, reflecting a decrease of around 0.8% compared to the raw data. The total value of reimbursements after the policy change was \$25,196,071.60, representing a reduction of approximately 0.8%.

Finding 2:

MEDIAN CLAIMS (raw datasets):

The median value of claims reported before the policy change (pre-policy) was \$145.73 The median value of claims reported after the policy change (post-policy) was \$198.36 AVERAGE CLAIMS (cleaned datasets):

Average value of claims before the policy change: \$285.01 Average value of claims after the policy change: \$321.45

	Dataset	count	mean	std	min	25%	50%	75%	max
adj_amt	Pre-Policy Raw Claims	301179.0	303.85	909.28	0.00	44.79	145.73	400.00	99048.0
adj_amt	Post-Policy Raw Claims	44408.0	330.34	546.10	0.01	71.96	198.36	460.61	62093.0
	Datase	et cour	nt mea	ın st	d mir	n 25%	50%	75%	max
adj_amt	Pre-Policy Cleaned Clain	ns 285512	.0 285.0	1 311.8	1 0.00	42.45	159.64	420.0	986.32
adi amt	Post-Policy Cleaned Clain	ne 42168	0 321/	E 333 /	8 N N	1 71 56	200.00	495 N	1130 16

The statistical findings provide Insights into the effects of the policy change on the adjusted amount of claims (adj_amt).

Looking at the Pre-Policy Raw Claims dataset, before the policy change, the average adjusted amount (adj_amt) was \$303.85, with a high variability indicated by a standard deviation of \$909.28. After the policy change, in the Post-Policy Raw Claims dataset, the average adjusted amount decreased to \$330.34, and the variability decreased as well, as shown by the lower standard deviation of \$546.10.

Similarly, in the Pre-Policy Cleaned Claims dataset, before the policy change, the average adjusted amount was \$285.01, with a standard deviation of \$311.81. After the policy change, in the Post-Policy Cleaned Claims dataset, the average adjusted amount increased slightly to \$321.45, and the variability decreased with a lower standard deviation of \$333.48.

From these findings, we can infer that the policy change has had an impact on the adjusted amounts of claims. In both the raw and cleaned datasets, there is a decrease in the variability of adjusted amounts after the policy change. This suggests that the policy change may have led to more consistent adjusted amounts in the claims data, as indicated by the decrease in the standard deviation.

However, these findings are based on the analysis of the adj_amt feature alone and may not capture the full impact of the policy change on other aspects of the claims data. Further analysis and consideration of additional factors would be necessary to fully understand the effects of the policy change on claims variability.

MEDIAN REIMBURSEMENTS (raw datasets):

The total value of reimbursements reported before the policy change (pre-policy) was \$635.68. The total value of reimbursements reported after the policy change (pre-policy) was \$588.66. AVERAGE REIMBURSEMENTS (cleaned datasets):

Total value of reimbursements before the policy change: \$ 48523597.35 Total value of reimbursements after the policy change: \$ 25196071.60

		Dataset	count	mean	std	min	25%	50%	75%	max
benefit_amou	unt Pre-Policy Raw Re	eimbursements	76920.0	635.68	409.71	0.01	281.00	658.0	900.0	5000.0
benefit_amo	unt Post-Policy Raw Re	eimbursements	43100.0	588.63	430.26	0.01	250.11	516.0	880.0	9000.0
		Dataset	count	mean	std	min	25%	50%	75%	max
benefit_amount	Pre-Policy Cleaned Reim									

The statistical findings provide insights into the effects of the policy change on the benefit amount of reimbursements (benefit amount).

In the Pre-Policy Raw Reimbursements dataset, before the policy change, the average benefit amount was \$635.68, with a high variability indicated by a standard deviation of \$409.71. After the policy change, in the Post-Policy Raw Reimbursements dataset, the average benefit amount decreased slightly to \$588.63, and the variability decreased as well, as shown by the lower standard deviation of \$430.26.

Similarly, in the Pre-Policy Cleaned Reimbursements dataset, before the policy change, the average benefit amount was \$640.07, with a standard deviation of \$399.64. After the policy change, in the Post-Policy Cleaned Reimbursements dataset, the average benefit amount decreased slightly to \$587.51, and the variability decreased with a lower standard deviation of \$418.91.

From these findings, we can infer that the policy change has had an impact on the benefit amounts of reimbursements. In both the raw and cleaned datasets, there is a decrease in the variability of benefit amounts after the policy change. This suggests that the policy change may have led to more consistent benefit amounts in the reimbursements data, as indicated by the decrease in the standard deviation.

However, these findings are based on the analysis of the benefit_amount feature alone and may not capture the full impact of the policy change on other aspects of the reimbursements data. Further analysis and consideration of additional factors would be necessary to fully understand the effects of the policy change on reimbursements variability.

Finding 3:

Time-based Comparison:

Raw Datasets

CATEGORY	COUNT	TOTAL AMOUNT
Claims - Before Policy Change:	301179	\$91,512,819.47
Claims - After Policy Change:	44408	\$14,669,931.82
Reimbursements - Before Policy Change:	76919	\$48,896,250.00
Reimbursements - After Policy Change:	43096	\$25,368,774.00

Cleaned Datasets

	Category	Count	Total Amount
0	Claims - Before Policy Change	285512	\$81,374,247.18
1	Claims - After Policy Change	42168	\$13,555,037.66
2	Reimbursements - Before Policy Change	75810	\$48,523,597.35
3	Reimbursements - After Policy Change	42886	\$25,196,071.60

The raw dataset provides information on the volume of claim activity and reimbursement activity before and after the policy change. Before the policy change, there were 301,179 claims filed, resulting in a total amount of \$91,512,819.47. After the policy change, the number of claims reduced to 44,408, with a total amount of \$14,669,931.82. Similarly, for reimbursements, there were 76,919 reimbursements before the policy change, totaling \$48,896,250.00. After the policy change, the number of reimbursements decreased to 43,096, with a total amount of \$25,368,774.00.

The cleaned dataset provides a more refined view, taking into account the specific data points related to the claims and reimbursements. Before the policy change, there were 285,512 claims, resulting in a total amount of \$81,374,247.18. After the policy change, the number of claims decreased to 42,168, with a total amount of \$13,555,037.66. Similarly, for reimbursements, there were 75,810 reimbursements before the policy change, totaling \$48,523,597.35. After the policy change, the number of reimbursements reduced to 42,886, with a total amount of \$25,196,071.60.

Given that the post-policy period only includes three months of data compared to a longer period for the pre-policy period, it is important to interpret the findings with caution. A year-over-year analysis may provide a more comprehensive understanding of the impacts of the policy change on the volume of claims and reimbursements. Additionally, due to the complexity of the relationships between claims and reimbursements, further exploration using machine learning algorithms could offer valuable insights.

Finding 4:

Temporal by Date

Raw Datasets

DATE	COUNT	AMOUNT	CATEGORY	POLICY PERIOD		D/	ATE COUNT	AMOUN	IT CATEGORY	PAY	PERIOD	
2	39800	21148473.74	Claims	Before Policy		2	6534	3493356.		After	Policy	Change
1	32924	17351818.79	Claims	Before Policy		1	5729	3004079.				Change
3	32749	15826408.76	Claims	Before Policy		3	5052	2402392				Change
10	13304	2715230.31	Claims	Before Policy		6	2563	554809.2				Change
9	13118	2561357.63	Claims	Before Policy		7	2367	481899.5				Change
8	13110	2672738.92	Claims	Before Policy		9	2218	502853.6				Change
6	13054	2833728.45	Claims			5	2194	427281.2				Change
4	13045	2642380.24	Claims	Before Policy		10	2027	455730.6				Change
5	13010	2640267.46	Claims	Before Policy		4	2022	409693.4				Change
7	12982	2604928.22	Claims	Before Policy		8	2011	347870.5				Change
11	8873	1613984.65	Claims			11	1246	215828.5		After	Policy	Change
12	8126	1648912.53	Claims			13	1098	217640.7				Change
13	7394	1327469.6	Claims			12	962	203305.9				Change
15	6332	1049697.75	Claims			30	884	319395.3				Change
16	6184	1068442.22	Claims			27	875	176032.3				Change
14	6107	1170808.54	Claims			31	821	254155.9				Change
18	5997	1007335.91	Claims	Before Policy		29	810	236357.6				Change
17	5572	825830.21	Claims	Before Policy		14	638	102157.8	3 Claims			Change
19	5246	832878.22	Claims	Before Policy		28	633	138570.1				Change
23	4953	810636.62	Claims	Before Policy		15	563	108322.2				Change
22	4869	911274.41	Claims			16	560	99076.69) Claims			Change
21	4827	714185.76	Claims			19	465	93626.81	L Claims			Change
20	4452	728838.75	Claims			17	442	77546.99) Claims			Change
24	3570	547634.65	Claims			18	427	90458.13	Claims			Change
30	3511	789004.38	Claims			20	251	45849.69				Change
29	3466	737656.98	Claims	Before Policy		21	229	43595.49				Change
25	3331	494648.79	Claims	Before Policy		26	219	64188.17				Change
26	3279	644835.28	Claims	Before Policy		23	163	25176.27				Change
28	3180	598719.34	Claims			25	162	35474.18				Change
27	2780	506728.23	Claims			22	134	25038.89				Change
31	2035	485964.13	Claims	Before Policy		24	109	18166.92	2 Claims			Change
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19	3493	2289171 Reimb	bursements	Before Policy	Change	10	2363	1438088	Reimbursements	After	Policy	Change
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Temporal by Date Cleaned Datasets

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	DATE	COUNT	AMOUNT	CATEGORY	POLICY PERIOD						
1	2	37660	1.916976e+07	7 Claims	Before Policy Change	1					,
0	1	31366	1.605140e+07	7 Claims	Before Policy Change	0					·
2	3	30779	1.434405e+07	7 Claims	Before Policy Change	2					
9	10	12723	2.353139e+06	6 Claims	Before Policy Change	9					·
7	8	12523	2.330626e+06	6 Claims	Before Policy Change	7					
8	9	12491	2.349499e+06	6 Claims	Before Policy Change	8	8 9	8 9 12491	8 9 12491 2.349499e+06	8 9 12491 2.349499e+06 Claims	8 9 12491 2.349499e+06 Claims Before Policy
4	5	12428	2.327090e+06	6 Claims	Before Policy Change	4	4 5	4 5 12428	4 5 12428 2.327090e+06	4 5 12428 2.327090e+06 Claims	4 5 12428 2.327090e+06 Claims Before Policy
5	6	12257	2.301271e+06	6 Claims	Before Policy Change	5	5 6	5 6 12257	5 6 12257 2.301271e+06	5 6 12257 2.301271e+06 Claims	5 6 12257 2.301271e+06 Claims Before Policy
3	4	12244	2.272919e+06	6 Claims	Before Policy Change	3	3 4	3 4 12244	3 4 12244 2.272919e+06	3 4 12244 2.272919e+06 Claims	3 4 12244 2.272919e+06 Claims Before Policy
6	7	12163	2.272820e+06	6 Claims	Before Policy Change	6	6 7	6 7 12163	6 7 12163 2.272820e+06	6 7 12163 2.272820e+06 Claims	6 7 12163 2.272820e+06 Claims Before Policy
10	11	8469	1.406288e+06	6 Claims	Before Policy Change	10	10 11	10 11 8469	10 11 8469 1.406288e+06	10 11 8469 1.406288e+06 Claims	10 11 8469 1.406288e+06 Claims Before Policy
11	12	7652	1.345255e+06	6 Claims	Before Policy Change	11	11 12	11 12 7652	11 12 7652 1.345255e+06	11 12 7652 1.345255e+06 Claims	11 12 7652 1.345255e+06 Claims Before Policy
12	13	6940	1.116303e+06		Before Policy Change	12	12 13	12 13 6940	12 13 6940 1.116303e+06	12 13 6940 1.116303e+06 Claims	12 13 6940 1.116303e+06 Claims Before Policy
14	15	5980	9.493908e+05		Before Policy Change	14	14 15	14 15 5980	14 15 5980 9.493908e+05	14 15 5980 9.493908e+05 Claims	14 15 5980 9.493908e+05 Claims Before Policy
15	16	5907	9.688010e+05		Before Policy Change	15	15 16	15 16 5907	15 16 5907 9.688010e+05	15 16 5907 9.688010e+05 Claims	15 16 5907 9.688010e+05 Claims Before Policy
13	14	5827	9.244922e+05		Before Policy Change	13	13 14	13 14 5827	13 14 5827 9.244922e+05	13 14 5827 9.244922e+05 Claims	13 14 5827 9.244922e+05 Claims Before Policy
17	18	5747	8.477631e+05		Before Policy Change	17	17 18	17 18 5747	17 18 5747 8.477631e+05	17 18 5747 8.477631e+05 Claims	17 18 5747 8.477631e+05 Claims Before Policy
16	17	5313	7.744622e+05			16	16 17	16 17 5313	16 17 5313 7.744622e+05	16 17 5313 7.744622e+05 Claims	
					Before Policy Change	18					
18	19	5046	6.959147e+05		Before Policy Change	22					•
22	23	4684	6.777853e+05		Before Policy Change	20					
20	21	4627	6.497966e+05		Before Policy Change						
21	22	4591	6.498902e+05		Before Policy Change	21					,
19	20	4301	6.115485e+05	5 Claims	Before Policy Change	19	19 20	19 20 4301	19 20 4301 6.115485e+05	19 20 4301 6.115485e+05 Claims	19 20 4301 6.115485e+05 Claims Before Policy
23	24	3468	4.672895e+05	5 Claims	Before Policy Change	23	23 24	23 24 3468	23 24 3468 4.672895e+05	23 24 3468 4.672895e+05 Claims	23 24 3468 4.672895e+05 Claims Before Policy
28	29	3325	6.479707e+05	Claims	Before Policy Change	28	28 29	28 29 3325	28 29 3325 6.479707e+05	28 29 3325 6.479707e+05 Claims	28 29 3325 6.479707e+05 Claims Before Policy
	DATE	COUNT	AMOUNT	CATEGOR	RY POLICY PERIOD		DATE	DATE COUNT	DATE COUNT AMOUNT	DATE COUNT AMOUNT CATEGOR	DATE COUNT AMOUNT CATEGORY POLIC
18	19	3458	2.269802e+06	Reimbursemen	ts Before Policy Change	9	9 10	9 10 2355	9 10 2355 1429502.520	9 10 2355 1429502.520 Reimbursemen	9 10 2355 1429502.520 Reimbursements After Police
14	15	3304	2.098581e+06	Reimbursemen	ts Before Policy Change	8	8 9	8 9 2193	8 9 2193 1396549.165	8 9 2193 1396549.165 Reimbursemen	8 9 2193 1396549.165 Reimbursements After Police
8	9	3273	2.223630e+06	Reimbursemen	ts Before Policy Change	18	15 16	15 16 2189	15 16 2189 1286833.380	15 16 2189 1286833.380 Reimbursemen	15 16 2189 1286833.380 Reimbursements After Police
20	21	3253	2.005508e+06	Reimbursemen	ts Before Policy Change	7	7 8				
12	13	3192	2.123984e+06	Reimbursemen							
17	18	3153		Reimbursemen							
22	23			Reimbursemen	, ,		16 17				
15	16			Reimbursemen	, ,		13 14				
13	14				ts Before Policy Change		6 7				
19	20			Reimbursemen			26 27				
11	12			Reimbursemen							
21	22			Reimbursemen							
16	17	2869	1.827657e+06	Reimbursemen		20	20 21	20 21 1785	20 21 1785 1060020.875	20 21 1785 1060020.875 Reimbursemen	20 21 1785 1060020.875 Reimbursements After Police
7	8			Reimbursemen	, ,		12 13				
9	10			Reimbursemen			27 28				
6	7			Reimbursemen							
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27	28			Reimbursemen	-						
25	26			Reimbursemen	, ,						
28	29			Reimbursemen			28 29				
10	11			Reimbursemen			30 31				
	5			Reimbursemen	, ,						
4		1017	1.164459e+06	Reimbursemen	ts Before Policy Change	16	19 20			19 20 937 009112.000 Rellinguisemen	19 20 937 539772.880 Reimbursements After Police
24	25					4-				45 40 040 004045 500 Deineburgen	45 40 COMPANIE FOR Deinstrumente After Delic
	25 30			Reimbursemen	ts Before Policy Change						

<u>Finding 5:</u>
Estimator of the Cumulative Distribution Function
Cleaned Datasets



To compare the distribution of Claims before and after the policy change, ECDF plots can be utilized. An ECDF (Empirical Cumulative Distribution Function) represents the cumulative probability distribution of a dataset. For the Claims feature, two ECDFs can be generated - one for Claims before the policy change and another for Claims after the policy change. The x-axis of the ECDF represents the Claims amount, while the y-axis represents the cumulative probability.

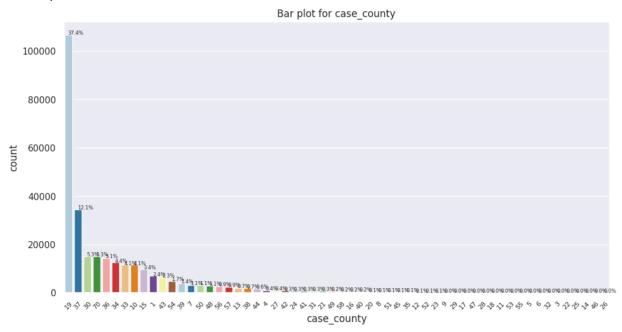
Similarly, the distribution of Reimbursements before and after the policy change can also be compared using ECDF plots. By computing the ECDF for the Reimbursements feature, the cumulative probability distribution for Reimbursements before the policy change and Reimbursements after the policy change can be visualized. This allows the observation of any differences in the distribution patterns.

When interpreting these ECDF plots, it is important to understand the axes. The x-axis represents the variable being analyzed, such as Claims amount or Reimbursements amount. The y-axis represents the cumulative probability, indicating the proportion of values that are less than or equal to a certain value on the x-axis.

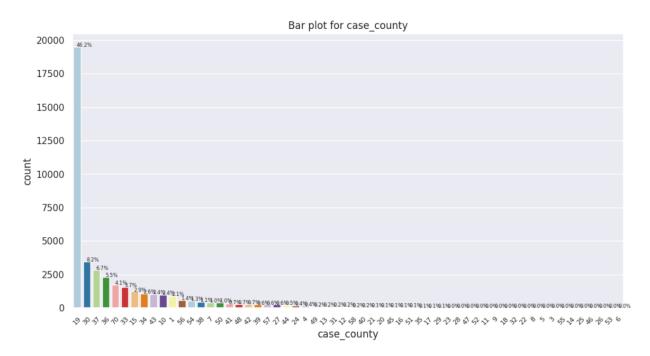
Additionally, continuous numeric variables like adj_amt and benefit_amount can be considered as alternatives to the Claims and Reimbursements features. By comparing the ECDFs of these variables between the two subsets (before and after the policy change), valuable insights can be gained regarding the differences in these metrics across the two time periods.

Finding 6: Cases by Counties Cleaned Datasets

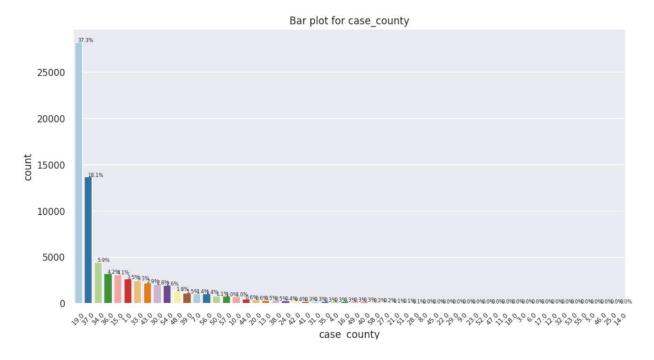
Pre-Policy Claims



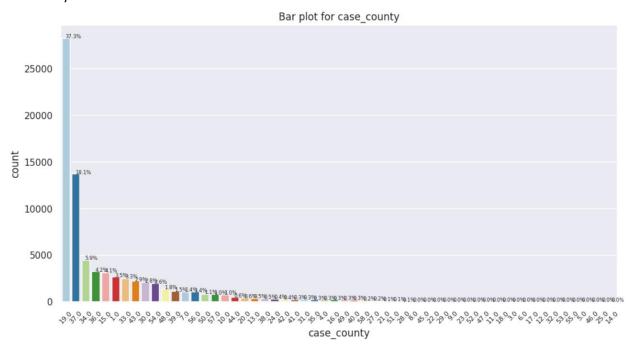
Post-Policy Claims



Cases by Counties Cleaned Datasets Pre-Policy Reimbursements



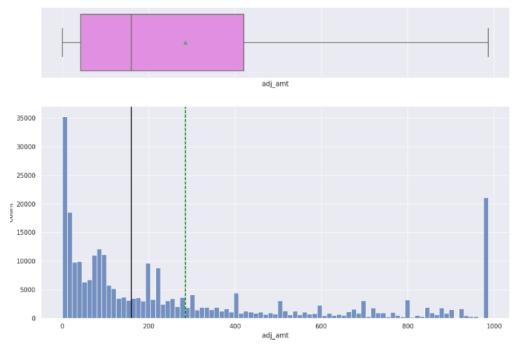
Post-Policy Reimbursements



Finding 7:
Distribution

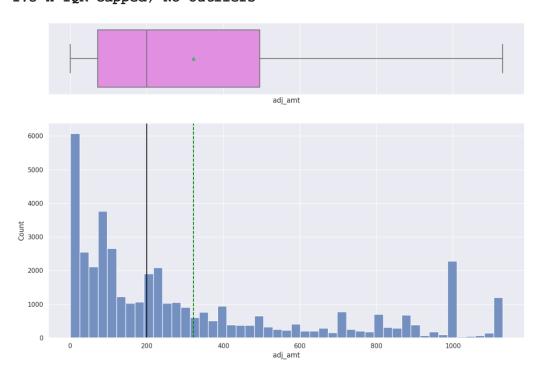
Cleaned Datasets Pre-Policy Claims

1.5 x IQR Capped; No Outliers



Cleaned Datasets
Post_Policy Claims

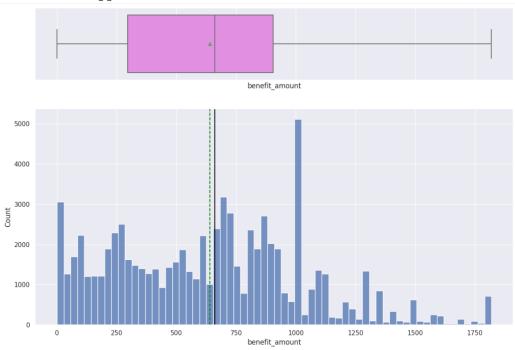
1.5 x IQR Capped; No Outliers



Cleaned Datasets

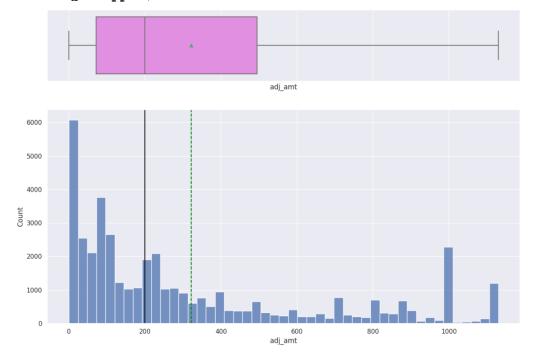
Pre-Policy Reimbursements

$1.5 \times IQR$ Capped; No Outliers



Cleaned Datasets Post_Policy Claims

1.5 x IQR Capped; No Outliers



Conclusions and Recommendations:

Based on the analysis conducted, several key findings emerge regarding the effects of the policy change on claims and reimbursements. The cleaned datasets reveal a decrease in the total value of claims and reimbursements after the policy change, indicating a potential impact of the policy on the overall volume of activity. Furthermore, the analysis of median and average claims and reimbursements suggests variations in the adjusted amounts and benefit amounts, indicating potential changes in the distribution of these values.

The findings are complemented by the histogram and boxplots, which provide a visual representation of the distribution of claim and reimbursement values before and after the policy change. The histogram illustrates the frequency of values within specific ranges, while the boxplots depict the median, quartiles, and outliers. By examining these visualizations alongside the summary statistics, a comprehensive understanding of the impact of the policy change on the distribution of claims and reimbursements can be obtained.

It is important to note that the observed changes in claims and reimbursements may be influenced by factors beyond the policy change. Other factors such as changes in reporting behavior, social ethnic and socioeconomic trends, or external events might have contributed to the observed patterns. Therefore, it is essential to consider these factors when interpreting the results and drawing conclusions.

Regarding data reliability and representativeness, it is fair to acknowledge that the findings are based on the assumption that the provided dataset is reliable and representative of the entire population. However, potential data quality issues or biases within the dataset could affect the accuracy and generalizability of the results. Therefore, caution should be exercised when drawing conclusions based solely on the analyzed dataset.

In light of these findings, several recommendations can be made for further analysis and decision-making:

Conduct a year-over-year analysis: Since the post-policy period consists of only three months of data, it is recommended to perform a year-over-year analysis to compare the volume and value of claims and reimbursements. This will provide a more comprehensive understanding of the long-term effects of the policy change.

Evaluate data quality and completeness: Given the potential impact of data quality on the analysis results, it is recommended to assess the reliability and completeness of the dataset. Conducting data quality checks, identifying potential biases, and addressing any data issues will enhance the accuracy and robustness of the analysis.

Apply advanced analytical techniques: To gain more insights from the dataset, advanced analytical techniques such as machine learning algorithms can be employed. These techniques can uncover complex relationships and patterns in the data, providing a more in-depth understanding of the impact of the policy change on claims and reimbursements.

These insights, herein, can inform decision-making processes and guide future policies or interventions in the context of theft claims and reimbursements.