PHARMACIES NETWORK ANALYSIS

Pharmacies Network Analysis

To Dr. Mohamed Hamid
Head of Operations

From Eslam Nasr M.
Processing Officer

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SUMMARY

Across our network and in the absence payers' data, we picked the lowest 25% pharmacy depending on the claim's quality to be the weakness points of our network. We worked on collecting all received claims from January 2018 to December 2019 to have a reliable big data and we prevented 2020 claims data to avoid the unstable business market due to covid-19 pandemic. Our claims quality model range is from zero to 33.25 L. E per claim and the median is 15.09. any pharmacy with claim quality less than 11.34 L. E/claim is considered poor and those are listed in a separated excel file with detailed information.

INTRODUCTION

PHARMACIES NETWORK

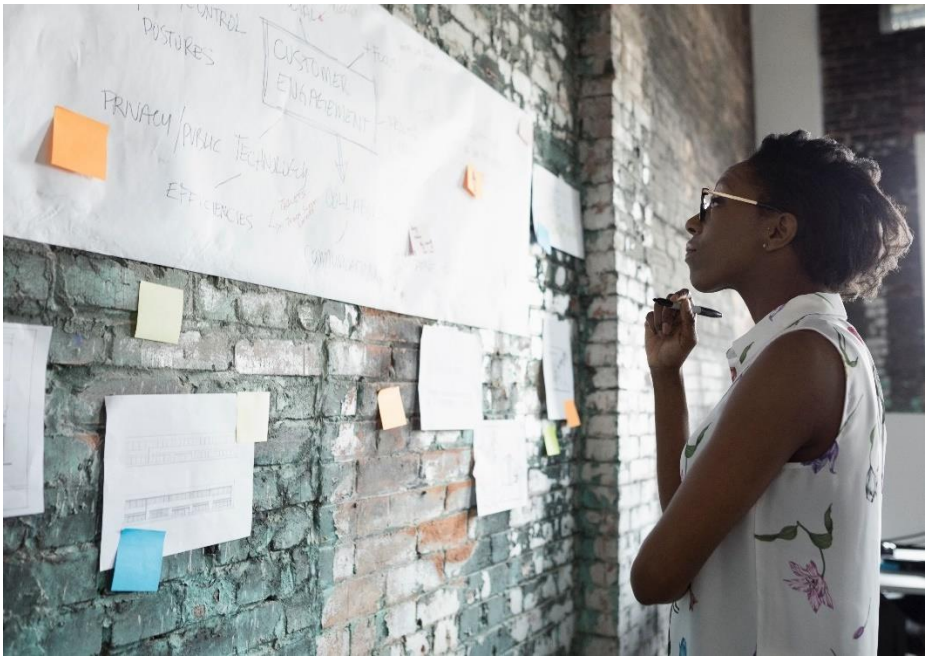
For strengthen our medical network, our company teams are working hardly to include valuable medical providers. Pharmacies network is a major section in our network about 50% of claims so we have to take care of this section and keen on developing and enhancing this part of our network.

PROFITABILITY ANALYSIS

The medical network is one of the basic elements in building TBAs and the strength of the TBA is corelated to the strength of its network which provides the acceptable profits for the clients and payers. Hence, the more providers are profitable the more the network is strong and reliable.

ANALITICAL RESEARSH

In this report, pharmacies profitability is the major subject. Using statistics and big data analysis, we get a clear vision of our pharmacies network current status but it is still relative to each payer. At the end of the report, a of the lowest pharmacies' proficiency.



OVERVIEW

Our data includes

- 204 pharmacies.
- 719,472 claims.

Pharmacies categories

- Chain pharmacies.
- Indie pharmacy.

THE QUESTION

Which pharmacies are the least profitable?

PROBLEMS

To obtain an accurate answer of the question we have to analyze the observables and the current situation of the claims from each pharmacy one by one which will be a headache due to big data and the massive network. We must put in consideration that we have big chains pharmacies and small individual pharmacies which make it different to generalize a single equation to describe the pharmacy coordinates on our network. In addition, the PCs assets are not compatible with big data manipulation software. Leak of time so we have to develop a fast algorithm. Leak of data about payers which is the indicator to the lower acceptable limits for each claim discount therefore the network is relative from a payer to another.

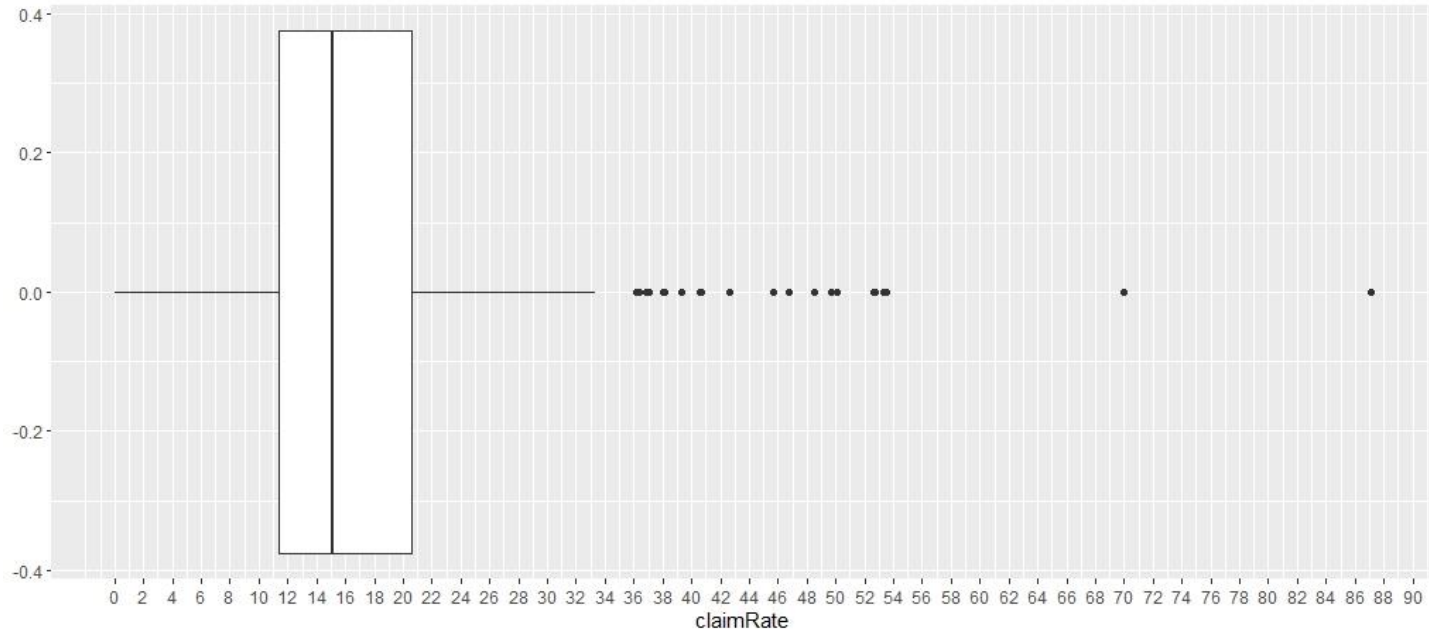
SOLUTION

To obtain a clear vision and detailed information, we firstly developed an algorithm that solve generalization problem. In another words, we worked on a method that could process and manipulate claims from all pharmacies size and give a general and absolute parameter. This parameter will be the claim quality for each pharmacy which will be indicated with claim rate. My solution is based on the data of all claims that were received from 1st January 2018 to 31 December 2019 for all pharmacies after updating the network to 2020 network by removing non-network providers according to network department. After cleaning data, we concentrated our work on three factors: 1) the gained total discount from each pharmacy, 2) the count of the claim and 3) the total approved amount. Then we built equations to estimate the claim rate for each pharmacy. The claim rate is the average discount amount for each claim for each pharmacy. Depending on this rate, we get the claim quality of a pharmacy. Hence, we applied the statistics and mathematics to give us all the information and a summary that describe the obtained data. The following sections include the detailed outcomes. To solve leak of payer's data, we considered the lowest 25% of pharmacies network has poor quality claims.

RESEARSH RESULTS

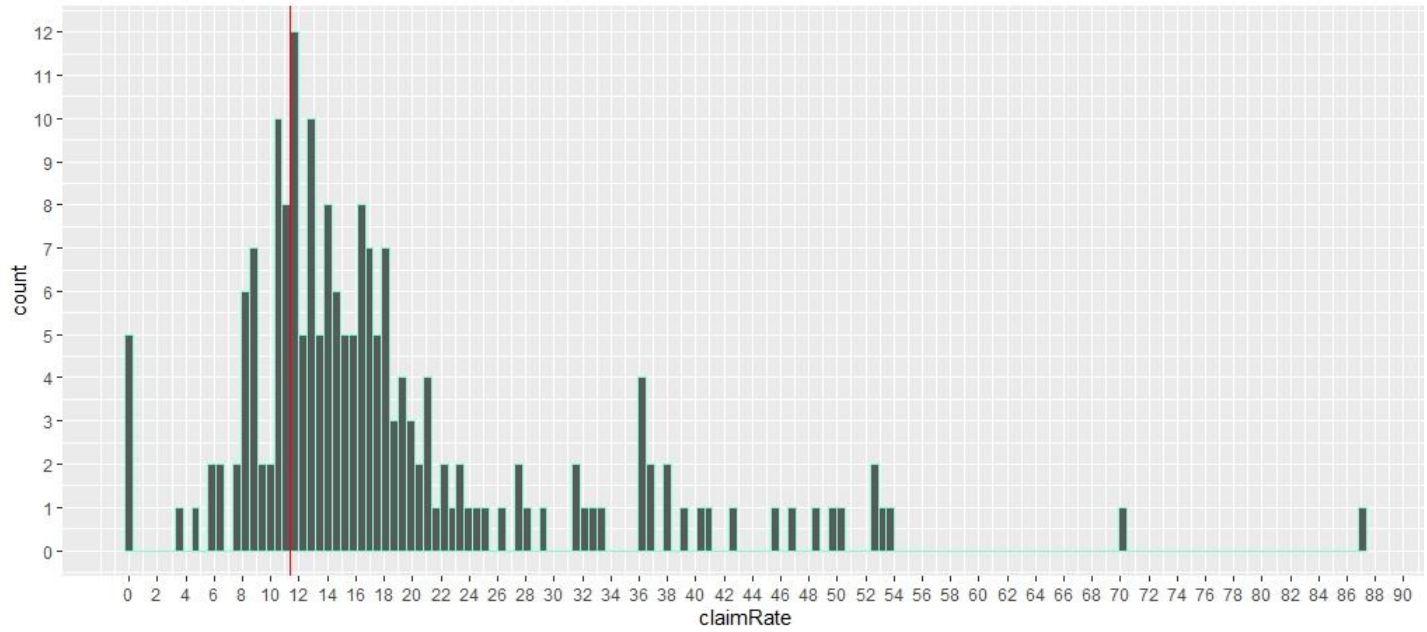
The key parameter of judging on the pharmacy profitability is claim rate (the average gained discount for each single claim) so our results will rely on this parameter. Instead of listing all data into a table, we used data visualization and graphics for mor understanding our outcomes.

A box whisker plot is the best plot to summarize our claims data set. From the following plot (plot.1) we can see that claim rate is ranged approximately [0, 87.08] Egyptian pound per claim and there are some outliers which are an unusual claim rate that doesn't follow our model and can't express the current state of the network. Even though these outliers are in the safe side with very high claims quality and high discount. Our study concentration will be on the range [0, 33.25] whose median is 15.09. The most important part is the first quartile (the first 25%) because it contains the lowest 25% pharmacies in claim quality. This limit is 11.34 L. E/claim so any pharmacy has claim rate lower than this limit is a poor claim quality.



Plot.1

For more detailed view over our pharmacy network data, the histogram plot will provide a detailed model for the data set. We can see the model of the claim rate for all our pharmacies in the histogram (plot.2). the X-axis is the claim rate and the Y-axis is the count of pharmacies that provide the same claim rate. As we mentioned before, our model is distributed from 0 to 33.25 and the rest are outliers. The lower limit red line is drawn at 11.34 and hence any pharmacy located on the left side of the red line is considered a poor-quality pharmacy. There are 5 pharmacies has zero claim rate which means that we don't get any discount from there providers or their claims are totally rejected or their discount is too close to zero.



Plot.2

With this report, we attached an excel file that has two sheets. The first sheet has all pharmacies network data related to our research and the second sheet contains only the poor-quality pharmacies. The tables will include all the names of pharmacies under the lower limit, their claim count and the total approved amount to have a clear picture about the pharmacy business size and finally the its claim rate.