

Profitability and Actuarial Overview of Health Insurance on SAS® Visual Analytics

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ABSTRACT

The report brings a simple and intuitive overview on behavior of technical provision and profitability of health insurance segments, based on historical data of a major insurance company. The profitability analysis displays indicators consisting of claims, prices, and quantity of insureds and their performance separated by gender, region, and different products. The report's user can simulate more accurate premiums by inputting information about medical costs increasing and target claims rate. The technical provision view identifies the greatest impacts on the provision, such as claims payments and future claims payments and reports. Also, it compares the real health insurance costs with the provision estimated on a previous period. Therefore, the report enables the user to get a unique panorama of health insurance underwriting and evaluate its results in order to make strategic decision for the future.

INTRODUCTION

ABOUT SULAMÉRICA

SulAmérica operates in multiple insurance segments, such as health and dental, auto and other property and casualty, The company also offers life and personal accident insurance as well as asset management, private pension, and savings bonds products.

In 2015, the Company's operating revenues totaled R\$15.7 billion, with R\$15.0 billion in insurance premiums. On December 31, 2015, SulAmérica Investimentos, the asset management business, had R\$30.3 billion in assets under management.

With approximately five thousand employees, SulAmérica conducts business through an extensive and diversified distribution network that includes more than 30,000 independent brokers, more than 20 distribution partnerships, and 16,000 bank branches accessible through bancassurance partners.

With approximately 7.0 million customers (individuals and companies) and 100% of revenues generated in Brazil, SulAmérica's administrative headquarters is located at Rua Beatriz Larragoiti Lucas, 121 in Rio de Janeiro. In 2015, 1 new branch were inaugurated, totaling 90 in all of Brazil.

Mission

To provide protection and well-being to individuals and organizations, at all stages of life, creating value in a sustainable manner through a relationship of trust and respect. [GRI G4-56]

Vision

To be recognized as the best option in the markets we serve, fulfilling our clients' needs with excellence through a close and solid relationship with our colleagues, brokers and business partners, seeking a balance between growth and profitability [GRI G4-56].

Values

- We are guided by the satisfaction of our customers and brokers
- We value our staff and teamwork
- We seek healthy and long-lasting relationships with our partners
- We always aim for the best results and the continuous improvement of our operations
- We fulfil our promises, preserving our commitment to sustainability

OBJECTIVE

The main objective of this report is to give a brief perception of health insurance segments behavior and be a tool to identify if the underwriting methodologies are plausible. It is segregated in four sections:

- General View: displays the share of a insured lives and claims rate of 2016 by segments and plans;
- Detailed Analysis: in this section, the share of insured lives and claims rate are segregated by gender, age group and states of Brazil;
- Premium Analysis: compares the actual monthly premium of a plan with its costs and a more accurate premium (target premium) considering medical costs increase rate and target claims rate;
- Claims Provision View: shows the major impacts on the provision, the behavior of claims payments and a comparison between real costs and the estimated costs.

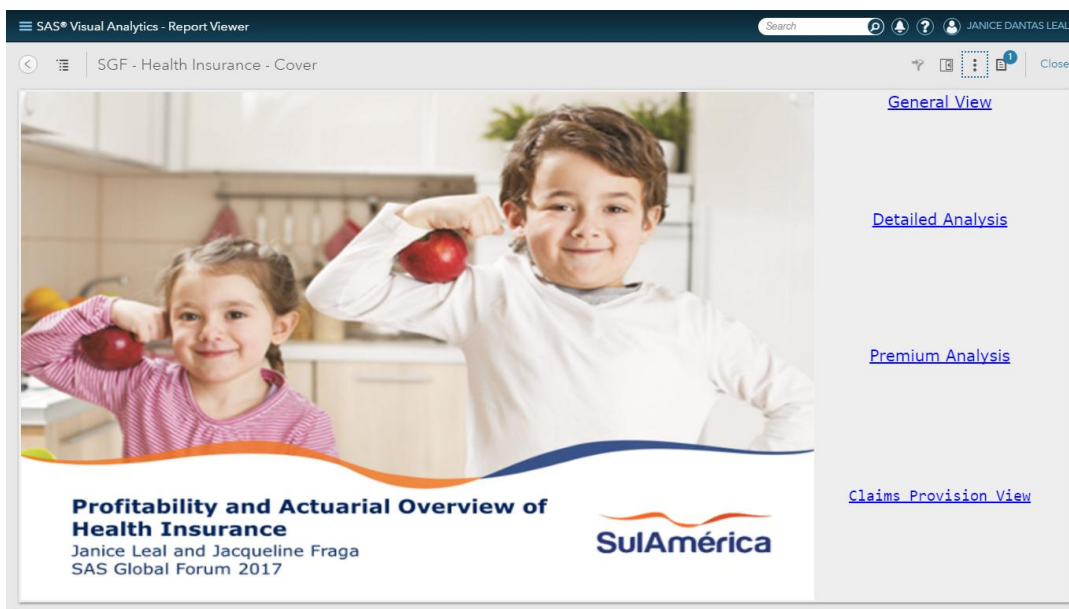


Figure 1. Report Cover

All data used on this report are fictional and prepared for this presentation only.

GENERAL VIEW

This first view enables the user to see the big picture of the health insurance claims and insured lives behavior in 2016. The variables used here are:

- Segments
 - Corporate: contracted for employees of and enterprise with more than 29 workers;
 - Individual: individual and familiar contracts;
 - SME (Small and Medium Enterprises): contracted for employees of and enterprise with less than 30 workers
 - Dental: contracts that are strictly for dental care insurance.

- Plans
 - Fit: small coverage of hospitals and clinics and no individual room in case of hospitalization;
 - Standard: good coverage of hospitals and clinics and no individual room in case of hospitalization
 - Special: good coverage of hospitals and clinics and individual room in case of hospitalization
 - Executive: great coverage of hospitals and clinics and individual room in case of hospitalization

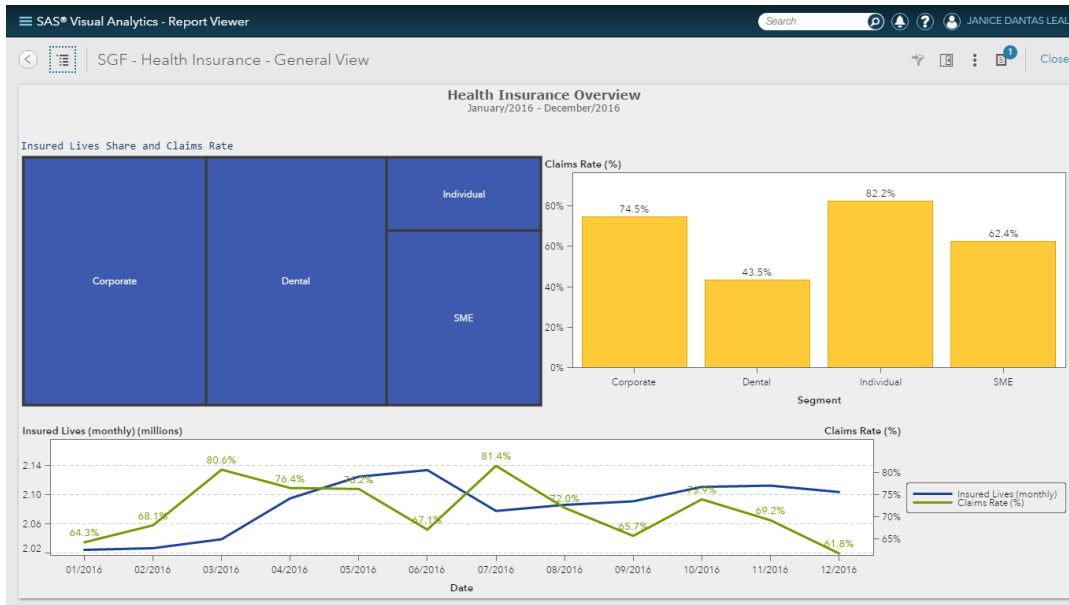


Figure 2. General View Section

INSURED LIVES SHARE AND CLAIMS RATE GRAPHICS

The map and bars graphic indicates the share of insured lives by segments, with the option to expand to plans, and their claims rate over the year of 2016.

The indicators displayed here are calculated as:

- Average Insured Lives

$$\text{Average Insured Lives} = \sum_{i=1}^{12} \text{Insured Lives}_i / 12, \quad i = \text{month}$$

- Claims Rate

$$\text{Claims Rate} = \sum_{i=1}^{12} \text{Claims Costs}_i / \sum_{j=1}^{12} \text{Premium}_j, \quad i, j = \text{month}$$

The line graphic demonstrates the same indicators above, but monthly. While using the report, it is possible to select one of the segments in the first graphic and the others will be filtered by the same segment.

By double-clicking a segment, the charts drill to plans. Therefore, the performance of each segment can be analyzed individually and so can each segment's plan.

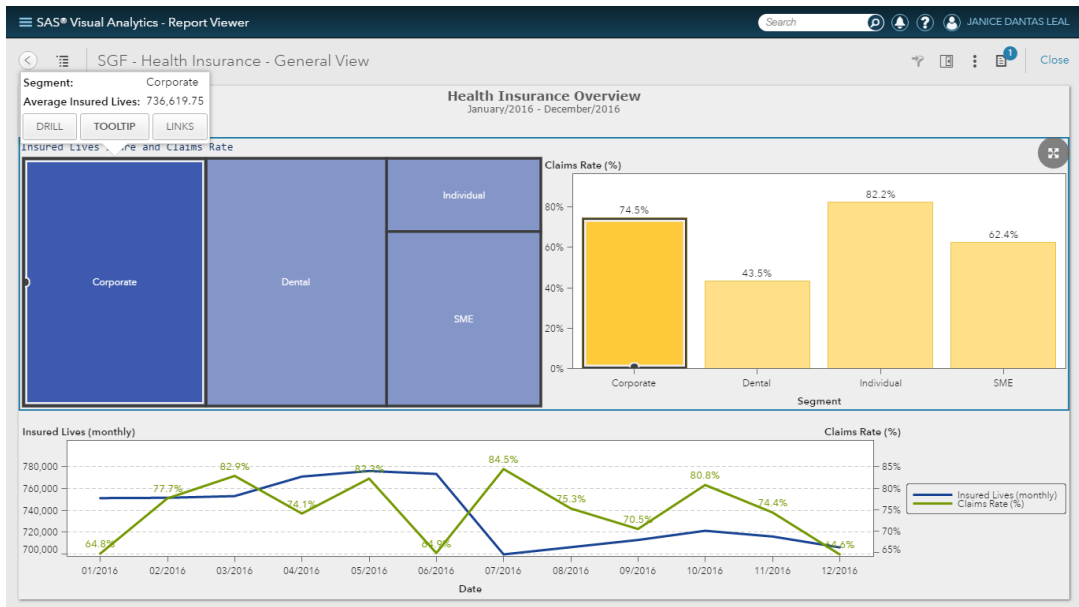


Figure 3. General View Section – Corporate segment selected

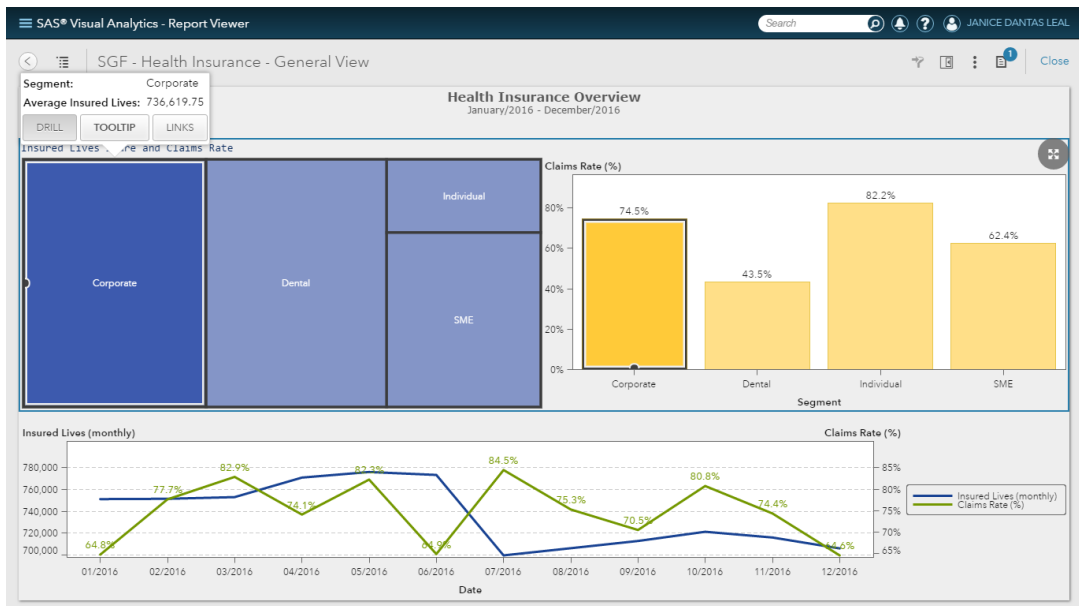


Figure 4. General View Section – Corporate drilled Plans

DETAILED ANALYSIS

This section illustrates in details of gender, age group and States distribution in 2016 of each segment and/or plan, which are filtered by the bar bottoms control on the top of the screen.

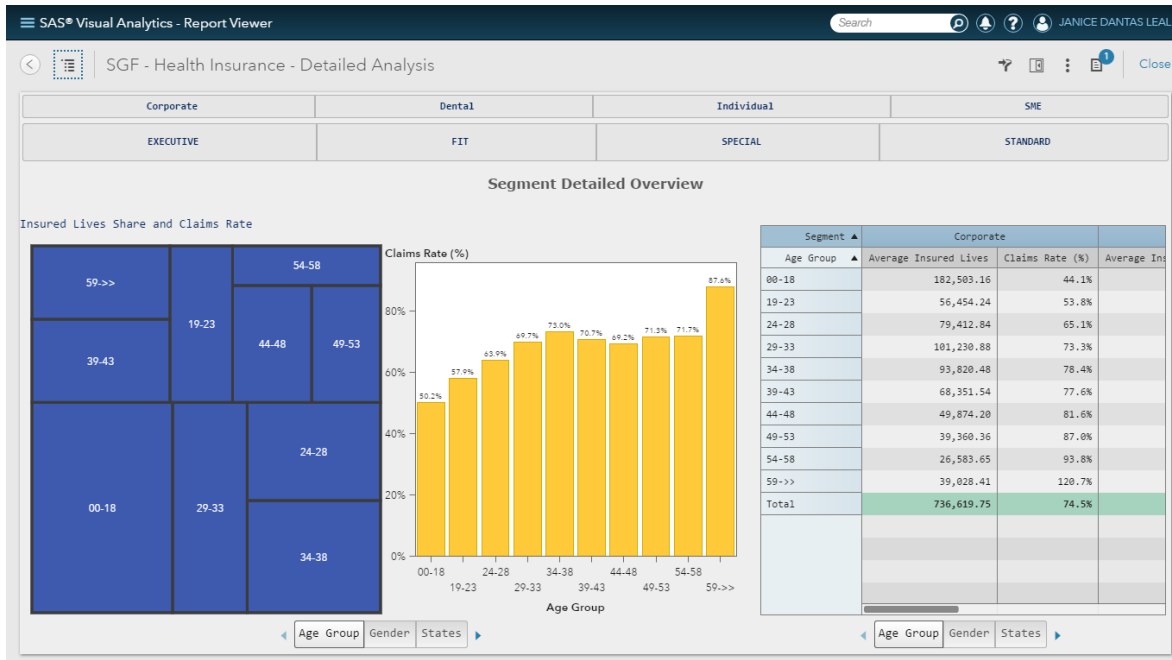


Figure 5. Detailed Analysis Section

The crosstab on the right helps the user understand numerically the Average Insured Lives and Claims rate behavior according to the variable selected.

The variables used in this section are:

- Age Group: range of ages which, in Brazil, are charged with different premium and have different volume of claims.
- Gender: male or female
- States: States of commercialization

PREMIUM ANALYSIS

The Premium Analysis Section enables the user to simulate scenarios of claims rate and medical costs increase in order to analyze if the commercial premium charged for each segment and/or plan are accurate to guarantee the profitability of health insurance.

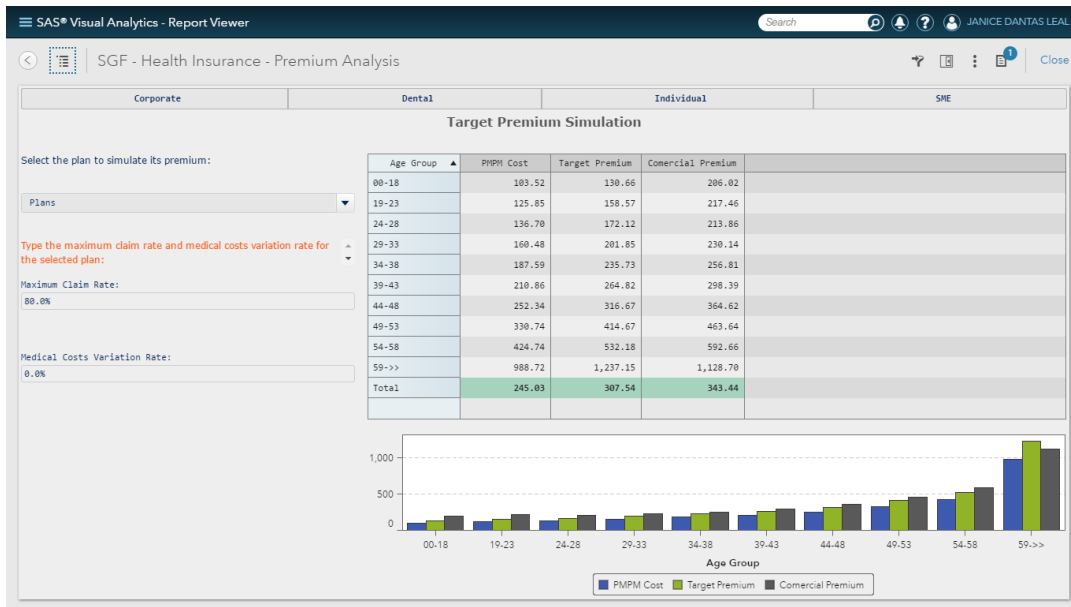


Figure 6. Detailed Analysis Section

The information displayed on this section is:

- Maximum Claim Rate: represents the strategic maximum value of claims rate that the Company assumes for a segment/plan. This is a parameter object and can be inputted by the user.
- Medical Costs Variation Rate: represents the increase or decrease rate of medical costs of a segment/plan. This is a parameter object and can be inputted by the user.
- PMPM Costs: represents the claims costs per member per month.

$$PMPM\ Costs = Average\ Month\ Costs / Average\ Insured\ Lives$$

- Target Premium: represents the month premium value calculated based on the Maximum Claim Rate and Medical Costs Variation Rate.

$$Target\ Premium = PMPM\ Costs * (1 + Medical\ Costs\ Variation\ Rate) / Maximum\ Claim\ Rate$$

- Comercial Premium: represents the actual premium paid by the insureds of a segment/plan.

Therefore, based on historical information, the analysis on this section must considerate if the commercial premium is enough to assure the profitability of the insurance or if it needs to be recalculated.

- If Commercial Premium \geq Target Premium: the actual Comercial Premium guarantees the profitability of the segment/plan, considering the Maximum Claim Rate and Medical Costs Variation Rate inputted by the user.
- If Commercial Premium $<$ Target Premium: the actual Comercial Premium does not guarantee the profitability of the segment/plan, considering the Maximum Claim Rate and Medical Costs Variation Rate inputted by the user, and must be recalculated.

CLAIMS PROVISION VIEW

This section presents information about claims provision and claims payment behavior of a segment. Also, it shows a comparison between the estimated payment and the incurred claims for a previous month.

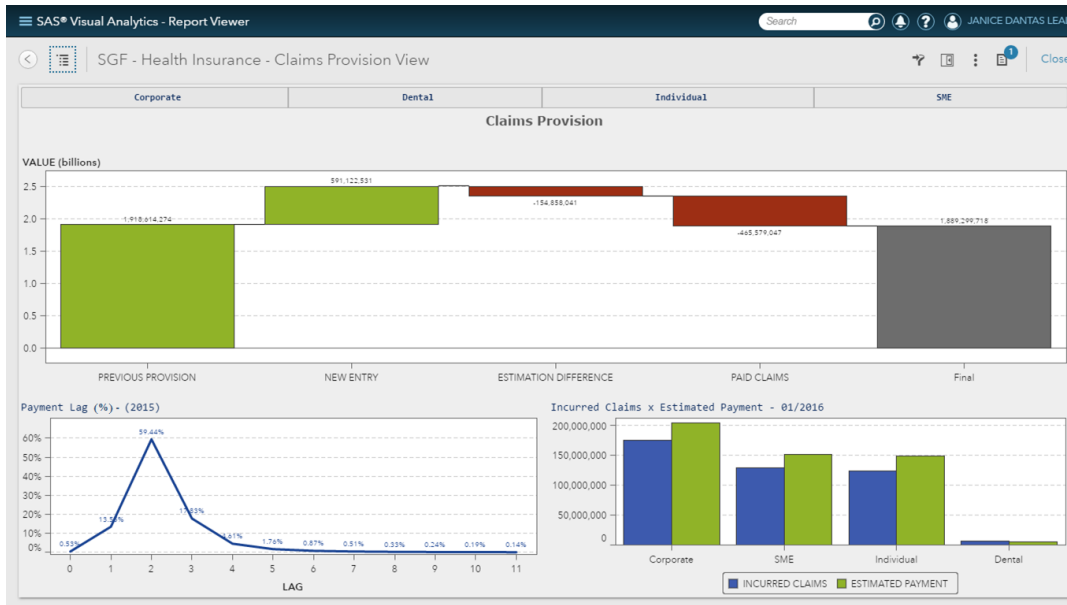


Figure 7. Claims Provision View

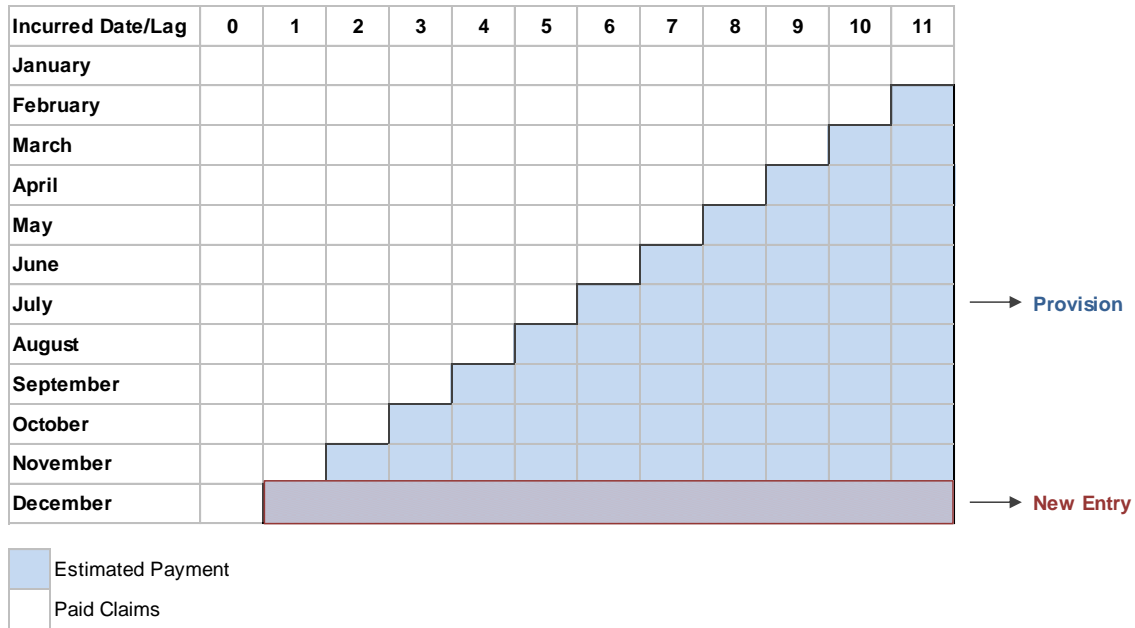
PROVISION INFORMATIONS

First, some explanation of the terms used on this section:

- Lag: represents the lag (month) between the incurred date of a claim and the payment date. In this case, the maximum lag value is 11, that is, incurred claims are fully paid in a year. Example: If a claim incurs on January and is paid on the same month, the lag value is 0. If a claim incurs on January and is paid in December, the lag value is 11.
- Payment Lag (%): it is the distribution rate by lag of payment of a claim incurred on a specific month.

$$Payment\ Lag\ Rate = \frac{Paid\ Claims_i}{\sum_{i=0}^{11} Paid\ Claims_i}, i = lag$$

- Estimated payment: future payment of a claim, considering the historical Payment Lag Rate.
- Provision: sum of estimated payments of the year.
- New Entry: sum of estimated payment of the current month.



WATERFALL GRAPHIC – PROVISION MOVIMENT

This graphic illustrates the provision behavior of a segment on December/2016. It enables the user to identify the impacts on the previous month provision, such as new entry, paid claims and estimation difference (between estimated payment on December x Paid Claims on December) that results on the actual provision.

LINE GRAPHIC – PAYMENT LAG(%)

This graphics indicates the observed behavior of payment on 2015 of a segment. This Payment Lag (%) is used on the estimated payments and provision.

The user can identify the most representative payment lag and try to investigate the cause of late payments.

BARS GRAPHIC – INCURRED CLAIMS X ESTIMATED PAYMENT

This graphic exposes the difference between the estimated payment and the actual incurred claims of January/2016 which, based on the Payment Lag Rate, is already fully paid. If the estimation value is far from the actual payment, it indicates that there's and underwriting inconsistency and provision methodology need to be reviewed.

CONCLUSION

This report is a quick tool to analyze the profitability and underwriting of health insurance, pointing the critical costs or provision mismatching. The four sections presented give a previous awareness of segments situation and helps on strategic decisions of pricing and provision methodologies.

Also, if a segment performs profitably, the executives can build a commercial campaign to increase its market share. For segments with losses, the strategy can evaluate the premium or stop/decrease its commercialization. The report is an option to identify this to scenarios on a fast manner.

REFERENCES

Website Available at <http://ri.SulAmérica.com.br/>

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