

# Block Dental

## Executive Summary

Team 11

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Block Dental has recently begun to shift from a business model of aggressive expansion and wants to reduce their loss ratio by enforcing stricter renewal policies through a new rate increase strategy. Over three years, Block Dental expects this new strategy to decrease loss ratio from 88% to 70% over three years. In order to accurately predict the impact of our rate increase strategy, we created logistic regression models to determine win probability of our clients. With this model, we developed a strategy that meets Block dentals goal of decreasing our loss ratio while retaining about 80% of our current clients.

### Business Issues and Potential Causes

- **High Loss Ratio:** To penetrate the dental insurance market, Block Dental lowered premiums to attract clients. Competitive pricing attracted clients with higher risk which lead to more claims. This led to some clients having a lower rate increase despite having a high loss ratio.

#### **Potential Causes: Rural vs. Urban Areas and Age of Groups Served**

- Rural vs Urban: Rural areas tend to have less dental providers and thus the insured are less likely to get checkups. When they do, they have a higher chance of having more expensive treatments, increasing the loss ratio of Block Dental. Urban areas have more dental services and larger populations that can afford them.
- Age: Older demographics have higher risk of dental coverage, as we are less likely to notice pains in our mouths before expensive treatment is required.

### Methodology

We first analyzed different factors to check for unintuitive win rates that may affect our model. There was no significant difference for group size. Loss ratio win rate increased as the loss ratio increased, which is intuitive with our strategy of retaining clients in the past - we offered lower premiums than competitors causing a higher win rate. Rate increase win rate naturally decreased as we charged higher rate increases. Lastly, channels with more personalized service had higher win rates than others.

We created a model with two factors to predict renewal win probability. Having at least two factors was vital in order to account for factors outside of rate increases that affect win probability. One factor is Net Dental Renewal Increase, since modeling a win probability based on a new rate increase strategy is the goal. We chose the channels in which Block Dental solicited renewals as the other factor because it was the most statistically significant out of all the factors we tested. Win rates for each channel were separately modeled for better win rate prediction accuracy. Our models can be seen in **Figures 1-6**.

## Implications

For possible strategies, we considered maximizing profit and maximizing revenue. Since our clients are profitable at a 75% loss ratio, maximizing profit has a sizeable increase in rate for clients above a 75% loss ratio. To maximize revenue, we set all rate increases to 10% - the highest rate increase before we begin to lose a significant amount of clients. For our initial strategies, we set a maximum rate increase of 15%. This is to avoid deterring clients from entering our policy due to the potential for a drastic rate increase. The simulated strategies can be seen in **Table 1** and **Table 2**. After our simulations, the final loss ratio for both strategies were below 70%. We took this as an opportunity to further lower our maximum rate increase to 10%. This will lose us some profit, but we retain about 10% more clients. In addition, the rate increase now increases by 1% each year, to further attract new clients before we return to our current average rate increase of 7-8% after 3 years.

## Recommendations

Our final proposed strategy is below:

### Proposed Strategy for Rate Increases

LR Bands	Rate Increase Year 1	Rate Increase Year 2	Rate Increase Year 3
(0,25]	3%	4%	5%
(25,50]	4%	5%	6%
(50,75]	5%	6%	7%
(75,100]	6%	7%	8%
(100,150]	10%	10%	10%
(150,9999]	10%	10%	10%

This will lead to the expected premiums, claims, and loss ratio over three years below:

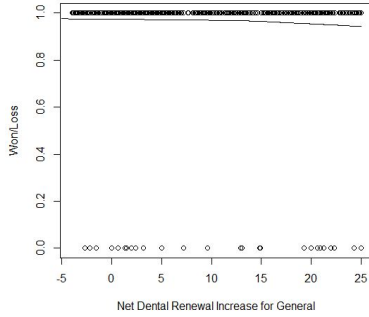
	Year 1	Year 2	Year 3
<b>Total Premiums</b>	\$ 105,030,900.27	\$ 105,734,131.38	\$ 106,871,498.19
<b>Total Claims</b>	\$ 86,308,013.96	\$ 80,323,791.64	\$ 74,733,021.65
<b>Loss Ratio</b>	<b>0.82</b>	<b>0.76</b>	<b>0.70</b>

We believe that we can solve our high loss ratio issue with our renewal strategy. However, we also recommend stricter claim processing and better underwriting. Stricter claim processing entails reviewing claims more carefully, lowering our claim costs. Better underwriting will restrict high risk groups from entering our insurance policy, also saving claim costs.

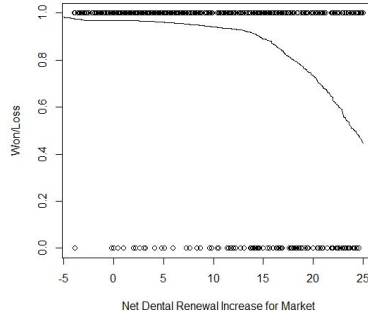
By following our proposed rate increase strategy as well as the above recommendations, we believe Block Dental will be at the target of a 70% loss ratio after three years, generating profit while retaining about 80% of our current clients.

## Memorandum

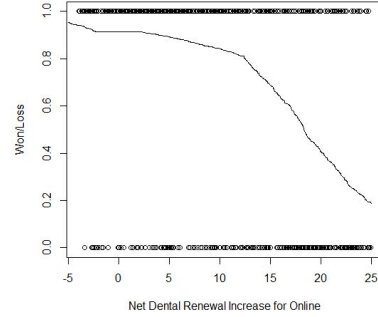
**Figure 1**



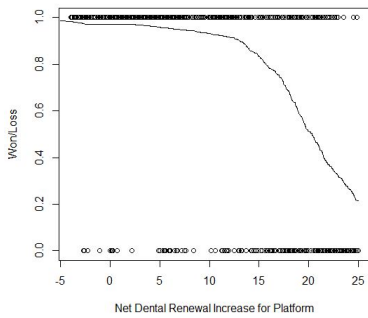
**Figure 2**



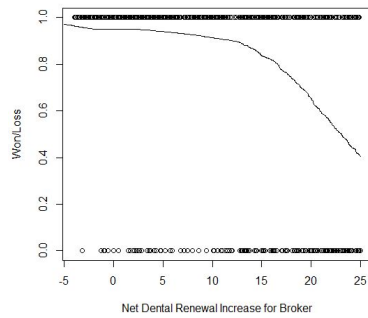
**Figure 3**



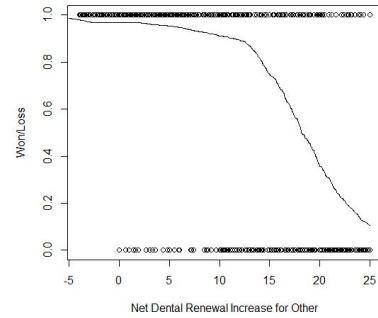
**Figure 4**



**Figure 5**



**Figure 6**



**Table 1**  
**Maximizing Profit Strategy**

	Year 1	Year 2	Year 3
<b>Total Premiums</b>	\$ 103,781,706.55	\$ 103,420,261.07	\$ 103,631,099.62
<b>Total Claims</b>	\$ 81,526,498.11	\$ 72,408,079.51	\$ 64,881,891.68
<b>Loss Ratio</b>	<b>0.79</b>	<b>0.70</b>	<b>0.63</b>

**Table 2**  
**Maximizing Revenue Strategy**

	Year 1	Year 2	Year 3
<b>Total Premiums</b>	\$ 106,332,807.49	\$ 108,118,949.60	\$ 110,144,768.47
<b>Total Claims</b>	\$ 85,515,067.32	\$ 79,014,046.48	\$ 73,143,473.08
<b>Loss Ratio</b>	<b>0.80</b>	<b>0.73</b>	<b>0.66</b>