CAL Ninth Annual Actuarial Case Competition

Health & Benefits

Team Members

Yunliang (Lawrence) Chen

Brandon Cheng

Serene Supakkul

Kevin Zhu

Team 13

I. Health Insurance Plans

Components of a typical health insurance plan include the deductible, coinsurance, and out-of-pocket maximum. The deductible refers to the portion of the total annual claims that the policyholder is responsible for paying before the insurance company contributes. Coinsurance refers to the percentage of excess claims that the insured pays after the deductible. After the insured has paid the deductible, he/she will be responsible for paying a certain number of cents per additional dollar of claims until he/she reaches the out-of-pocket maximum, which indicates the maximum amount the insured can pay from the deductible and coinsurance within a given year. After the policyholder has paid the out-of-pocket maximum, the insurance company is responsible for paying all excess claims. Assuming a constant loss ratio, the expected premium cost to the insured will decrease as the deductible, coinsurance, or out-of-pocket maximum increase.

Bronze, silver, gold, and platinum are plans that have actuarial values of 60%, 70%, 80%, and 90% respectively. The actuarial value of a plan is the proportion of total claims that the insurer pays. Metal categories are based on how the insured and the insurer split the costs of healthcare (for example, with a bronze plan, in total, the policyholder pays 40% of the cost and the insurer pays the other 60%). Clearly, plans with a higher actuarial value will charge higher premiums.

II. Standalone Plan

Given the experience data, we have designed the following set of standalone plans for Rockwood-Leibowitz, shown below in Table 2.1. This data is based on the assumption that 2016 claims experience is indicative of 2018 claims, after applying an annual claim growth factor of 10%. We will also assume that all employees will enroll in the health plan to avoid the ACA penalty. This is a fair assumption because those most likely to opt out are high-salary employees who are capable of withstanding risk, but these people have the highest penalties under the ACA. These standalone rates will yield a loss ratio of 85%.

Plan Name	Platinum	Gold	Silver	Bronze
Deductible	650	1675	3000	5000
Out-of-pocket Maximum	3500	4500	6450	7350
Coinsurance	0.05	0.09	0.12	0.15
Actuarial Value	0.90	0.80	0.70	0.60
2018 PEPM Standalone Rates	$1,071.64	$952.62	$833.53	$714.37

Table 2.1: Standalone plan details and PEPM rates

III. Multi-Choice Plan

If Rockwood-Leibowitz's standalone plans were to be offered as a multi-choice option, the rates we presented would no longer be adequate. The key assumption we made when pricing standalone plans is that all employees will enroll in that plan. However, if we were to remove this assumption, we would see that high-claim employees tend to choose plans with higher actuarial value (to cover their high

costs), whereas lower-claim employees tend to choose plans with lower actuarial values (to save on premium). However, this reduction in premium-paying, low-claim members on the platinum plan would cause the loss ratio for that specific plan to skyrocket; thus, it is crucial to increase the PEPM rates to mitigate this risk.

When simulating enrollment in the multi-choice plan, we will assume that the 2016 claims are a good proxy for future experience. Additionally, we will continue to assume that all members must enroll in one of the four plans so they do not incur the ACA penalty. We will further assume that all employees will choose the plan that would cost them the least (both premiums and out-of-pocket payments), based on 2016 data. Although the differences in cost between plans can become arbitrarily small, the large amount of data ensures that these minor differences will roughly average out in aggregate. However, we do acknowledge that this simulation could be overly simplistic based on a single year's worth of data; thus, this model will need to be updated in coming years. Based on these assumptions, we will see the changes in premium relative to the single-plan offering in Table 3.1 below. The key result is that offering consumers the choice between multiple plans will increase overall rates for everyone because of adverse selection.

Plan Name	Platinum	Gold	Silver	Bronze
2018 PEPM Standalone Rates	$1,071.64	$952.62	$833.53	$714.37
Adverse Selection Rate Load	1.09	1.08	1.08	1.04
Simulated Enrollment	324	203	273	1200
Proposed Multi-Choice Rates	$1,168.09	$1,028.82	$900.22	$742.95

Table 3.1: Multi-choice PEPM rates and adverse selection rate load (increase in premium compared to standalone rates)

IV. Price Concerns

With the target loss ratio of 85%, it would be extremely difficult for Rockwood-Leibowitz to further decrease rates while maintaining a healthy ability to pay. The adverse selection rate load factors we selected already yield the minimum possible total premium while maintaining the loss ratio. By offering a multi-choice plan, it is crucial to increase all rates to help mitigate the risk of adverse selection. If Rockwood-Leibowitz is concerned on reducing the prices of their plans, the easiest possible way this could happen is by reducing the number of plans they offer. By examining an extreme case, we see that offering the bronze plan as a single-choice plan to all participants minimizes the premiums paid. However, if Rockwood-Leibowitz is set on offering a multi-choice plan, there is no further way we could reduce the rate loads without exposing themselves to dangerously high risks of adverse selection. Any further reduction in rate load will necessarily drive members away from a certain plan (leaving few to none remaining) or increase the overall loss ratio to uncomfortably high levels.

References

"Out-of-Pocket Maximum/Limit - HealthCare.gov Glossary." *HealthCare.gov*

"Understanding Marketplace Health Insurance Categories." *HealthCare.gov*