MILLIMAN ISSUE BRIEF

Medicare Supplement Underwriting Issue Brief #1

To ask, or not to ask: That is the (underwriting) question

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Medical underwriting in the Medicare supplement (i.e., MedSupp or Medigap) industry generally consists of "knock out" questions regarding medical history.

The rigor of underwriting may vary by company (conditions assessed and/or the look-back period for such conditions). Some carriers may use certain conditions to determine rate level and classification of covered individuals into tiers (e.g., "preferred" or "standard").

While underwriting may protect against excessive anti-selection, carriers may be able to optimize the balance between minimal screening of conditions and very rigorous screening that eliminates all but condition-free applicants.

From a financial perspective, looser underwriting (i.e., reduced screening) generally supports a greater volume of business at reduced margins per enrollee, while tighter underwriting (i.e., more comprehensive screening that limits the conditions covered) tends to support higher profit margins per enrollee while sacrificing volume.

Key underwriting consideration

Somewhere between loose and tight underwriting, is there an optimal level of underwriting that balances enrollment volume and profitability to maximize expected total profit? Could small changes in your current underwriting screening drive significant improvement in results? If so, how might a MedSupp carrier understand and prioritize those changes?

Based on our recent research using Medicare claims,[1] this issue brief explores the resources available to help carriers quantify the expected effect of possible MedSupp medical underwriting application changes and considerations. At a minimum, carriers may use such resources to perform a "checkup" on their current underwriting application questions and understand potential gaps in their current underwriting.

Case study overview

Let's take a "typical" MedSupp carrier with a "typical" underwriting application. Although each carrier's underwriting approach may be unique (i.e., there really is no such thing as typical), assume our hypothetical carrier, the Right Under Insurance Company (RUIC), requires underwriting for applicants who don't qualify for open enrollment or any guaranteed issue provisions, as MedSupp carriers commonly do.[2] RUIC believes it screens for diseases and conditions consistent with the market, but contemplates a review of its application to guide potential changes in the form of screening for additional conditions or removing certain conditions from the application.

The rationale for such an approach recognizes that RUIC may expect screening for additional conditions to reduce morbidity and sales volumes, although profit per enrollee may increase. The net change on total profit would depend on the magnitude of such changes, as well as changes in expenses. Depending on RUIC's expense structure, the optimal solution could be either a tightening (adding conditions to screen) or loosening (removing conditions to screen) of underwriting.

On the expense side, a simplifying assumption for RUIC is that certain administrative expenses are fixed within a reasonable range of potential increases or decreases in policies issued based on changes to the application. Such an assumption means a reasonable reduction in policies issued would not be expected to reduce administrative expenses, nor would a reasonable increase in enrollment be expected to result in higher administrative expenses. Such projections for RUIC assumes the other expenses (i.e., commissions and marginal percentage of premium expense) will vary depending on enrollment volume and changes in that volume.

[1] Medicare 5% sample, years 2014-2017.

[2] Refer to Section 12 of the National Association of Insurance Commissioners (NAIC) Medicare Supplement Model Regulation, at https://www.naic.org/store/free/MDL-651.pdf.

Underwriting change example

We constructed a profit optimization model to track claimants on a longitudinal basis under various medical underwriting and condition screens, based on historical Medicare claims and enrollment information.[3] Our modeling process allows the carrier (i.e., model user) to uncover and project alternative underwriting criteria to produce optimal results, customized to the carrier's specifications and assumptions. An analysis of RUIC's application uncovered multiple alternatives that indicated projected increases in profits:

- In some cases, looser underwriting may optimize results (total profits).
- In our hypothetical case study, tightened underwriting resulted in more situations with optimal results.
- In the extreme, a carrier may consider tightening underwriting to screen for all significant conditions, as identified by hierarchical condition category (HCC) codes. However, such an approach may not optimize total profits, and in the case of RUIC it did not.

Attachment A provides the current applicable screening criteria for evaluating RUIC's current application. Using our optimization model resulted in the following estimates, with optimal results (i.e., maximized total profit) obtained by screening for the following additional conditions:

- Rheumatoid Arthritis and Inflammatory Connective Tissue Disease
- Inflammatory Bowel Disease
- Chronic Ulcer of Skin, Except Pressure

What does this mean exactly? Based on financial assumptions, the addition of screening for these three conditions projects greater total profits than all other combinations, or even screening all significant conditions. Perhaps a combination of four or more conditions might yield even greater total profits but, for purposes of this case study and simplifying the analysis, we limited the number of maximum possible combinations to three.

The total effect would depend on the extent to which applicants with one or more of the above conditions do not have conditions already screened for in the underwriting process. In other words, individuals with one or more of these conditions, who also have one or more conditions that are already screened for, would be declined.

OPTIMIZATION MODEL RESULTS

Figure 1 provides a summary of optimized results from our optimization model and the detail shown in Attachment B, reflecting calculations over a theoretical 10-year policy life and assuming a 4.0% discount rate.

FIGURE 1: OPTIMIZATION MODEL RESULTS SCENARIO #1 ($ MILLION)

BASELINE ("CURRENT UNDERWRITING")	
Polices Sold	30,000
PV of Premium	$232.2
PV of Claims	$151.2
PV Commissions and Variable Expenses	$48.0
PV Fixed Admin Expenses	$18.2
Net Gain	$15.0
ALTERNATIVE ("OPTIMAL") SCREENING	
Polices Sold	28,724
PV of Premium	$222.5
PV of Claims	$139.5
PV Commissions and Variable Expenses	$45.9
PV Fixed Admin Expenses	$18.2
Net Gain	$18.9
Change in Net Gain	$3.9

Key conclusions include the following:

- A projected increase in profits of roughly $3.8 million on $232 million in baseline premium, driven by the combination of the following elements:
  - A 4.3% reduction in sales, with proportional reductions to premium revenue, commission expenses, and variable expenses. In this example, we assumed no change to fixed administrative expenses.
  - A 7.7% decline in claims, an amount greater than the proportional estimated reduction in premium, commissions, and variable expenses.
- Keep in mind this model reflects estimated changes in medically underwritten business only. Overall experience would be expected to have a higher loss ratio when open enrollment (OE) and guaranteed issue (GI) business is included. In addition, gains over the first six years reflect relatively high initial commission levels.

[3] Medicare 5% sample, years 2014-2017.

As noted earlier, Attachment B provides the detailed projection results for background. Expected profits are particularly sensitive to the interaction of baseline loss ratio and expense assumptions. The optimization process cycles through multiple combinations of screening alternatives to find the setting that maximizes the change in total profits. This phenomenon occurs because projected increases in total profits only occur when the reduction in claims exceeds the reduction in premium and expenses. The prospects for significantly increased profits by screening for additional conditions also depend on the current underlying level of screening (i.e., strength of underwriting).

Hypotheses, assumption sensitivity, and uses of the modeling and research

Our optimization model indicates that additional screening makes more sense if the baseline profitability is not already high. In other words, in a competitive environment, the more profitable you already are, the harder it is to be more profitable. Typical financial results in the competitive MedSupp industry don't lend themselves to ongoing excessive profits, nor are the exceptions likely looking for the solutions we present here.

While we only reviewed the first 10 years, a view using lifetime results may exhibit higher renewal profits, as commission expenses tend to drop significantly beyond year 10. Rather than predicting future profits, this process solves for optimal profits based on company-specific metrics and customizable baseline assumptions and underwriting scenarios.

One hypothesis may be that your carrier would gain from screening all significant conditions. On the other hand, if the need for volume or scale looms as a larger challenge for you, perhaps you need to prioritize where to adjust underwriting. "Optimal" gains would likely vary by case, and may differ from an immediate answer to "tighten underwriting." The underwriting modeling available has a myriad of uses, with the flexibility to test alternative scenarios:

- True optimization may combine screening for a few other new conditions with removing other conditions from the current screening process. Each carrier's new screened and unscreened conditions may vary. Users can expand to combinations of new screenings of conditions to understand the varying gains projected, and/or consider the projected effect from removing conditions (or combinations of conditions) from screening.
- Further applications of the model may establish customized thresholds for projected total profit and/or enrollment (or thresholds for changes to those measures), and test sensitivity around those thresholds. We can also customize assumptions to be more in tune with different projection periods than the 10-year period described in our example (e.g., lifetime, or shorter-term periods).
- Predictive analytics are an emerging investigation tool to help identify key conditions, capture the spectrum of condition combinations, and ultimately assist with finding application changes with the highest projected likelihood for optimized profits.

Conclusion

An optimal, or even improved, level of underwriting isn't going to be a "one size fits all" proposition for MedSupp carriers. The optimal underwriting approach in each unique case depends on a carrier's current competitive position, distribution model and scale, current and target profit margins and performance benchmarks, and commissions and operating expenses. Whether the goal is to overhaul your underwriting questions, tweak the application to yield improved results, or just perform an application "checkup" to guide future decision-making, MedSupp carriers may achieve potentially significant gains through an evaluation of Medicare claims resources and tools.

What's next?

In the issue brief to follow, we will explore underwriting considerations for the world after the Medicare Access and CHIP Reauthorization Act of 2015 (MACRA), with no plan C/F issues for new Medicare eligibles.

Caveats and limitations

Modeling based on Medicare historical claims will not capture the entire spectrum of true underwriting, as such modeling is limited to the conditions identified by HCC codes and ignores use of other underwriting tools and expertise (follow-up interviews, prescription drug screens, etc.). Historical claims may differ from future projection periods due to differences in claims longevity, severity, and other factors.

In addition, the modeled projections are based on a limited chronological range of data, which may not capture the underwriting process as reflected in screening based on look-back periods. However, our model is intended to identify the relative incremental effect of differences in underwriting applications.

As noted previously, actual carrier results are sensitive to underlying assumptions and changes going forward that are customizable to the carrier, as appropriate. We noted simplifying administrative expense assumptions for our example, and other critical performance assumptions include persistency, premium and claims trend, discount rates, and the distribution model. We relied on historical data to support the projections, as well as a number of critical assumptions that may be unique to the case profiled. Future company experience would vary from the projections and each carrier's experience may diverge from one another because of reliance on different baseline data and/or use of different supporting assumptions.

This issue brief is intended to demonstrate the capabilities of our MedSupp underwriting optimization model and is not intended to provide results for any one company.

Ken Clark, principal and consulting actuary for Milliman, and Nick Ortner, consulting actuary for Milliman, are members of the American Academy of Actuaries and meet the qualification standards of the American Academy of Actuaries to render the actuarial opinion contained herein.

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ATTACHMENT A: CURRENT APPLICABLE MEDICARE SUPPLEMENT SCREENING CRITERIA FOR RIGHTUNDER INSURANCE COMPANY

DESCRIPTION	HCC	ALLOW ISSUE?
HIV/AIDS	HCC1	No
Septicemia, Sepsis, Systemic Inflammatory Response Syndrome/Shock	HCC2	No
Opportunistic Infections	HCC6	Yes
Metastatic Cancer and Acute Leukemia	HCC8	No
Lung and Other Severe Cancers	HCC9	No
Lymphoma and Other Cancers	HCC10	No
Colorectal, Bladder, and Other Cancers	HCC11	No
Breast, Prostate, and Other Cancers and Tumors	HCC12	No
Diabetes with Acute Complications	HCC17	Yes
Diabetes with Chronic Complications	HCC18	No
Diabetes without Complication	HCC19	Yes
Protein-Calorie Malnutrition	HCC21	Yes
Morbid Obesity	HCC22	Yes
Other Significant Endocrine and Metabolic Disorders	HCC23	No
End-Stage Liver Disease	HCC27	No
Cirrhosis of Liver	HCC28	No
Chronic Hepatitis	HCC29	No
Intestinal Obstruction/Perforation	HCC33	Yes
Chronic Pancreatitis	HCC34	No
Inflammatory Bowel Disease	HCC35	Yes
Bone/Joint/Muscle Infections/Necrosis	HCC39	No
Rheumatoid Arthritis and Inflammatory Connective Tissue Disease	HCC40	Yes
Severe Hematological Disorders	HCC46	No
Disorders of Immunity	HCC47	No
Coagulation Defects and Other Specified Hematological Disorders	HCC48	No
Drug/Alcohol Psychosis	HCC54	No
Drug/Alcohol Dependence	HCC55	No
Schizophrenia	HCC57	No
Major Depressive, Bipolar, and Paranoid Disorders	HCC58	No
Quadriplegia	HCC70	No
Paraplegia	HCC71	No
Spinal Cord Disorders/Injuries	HCC72	No
Amyotrophic Lateral Sclerosis and Other Motor Neuron Disease	HCC73	No
Cerebral Palsy	HCC74	No
Myasthenia Gravis/Myoneural Disorders, Inflammatory and Toxic Neuropathy	HCC75	No
Muscular Dystrophy	HCC76	No
Multiple Sclerosis	HCC77	No
Parkinson's and Huntington's Diseases	HCC78	No
Seizure Disorders and Convulsions	HCC79	No
Coma, Brain Compression/Anoxic Damage	HCC80	No
Respirator Dependence/Tracheostomy Status	HCC82	No
Respiratory Arrest	HCC83	No

ATTACHMENT A: CURRENT APPLICABLE MEDICARE SUPPLEMENT SCREENING CRITERIA FOR RIGHTUNDER INSURANCE COMPANY

DESCRIPTION	HCC	ALLOW ISSUE?
Cardio-Respiratory Failure and Shock	HCC84	No
Congestive Heart Failure	HCC85	No
Acute Myocardial Infarction	HCC86	Yes
Unstable Angina and Other Acute Ischemic Heart Disease	HCC87	No
Angina Pectoris	HCC88	No
Specified Heart Arrhythmias	HCC96	No
Cerebral Hemorrhage	HCC99	No
Ischemic or Unspecified Stroke	HCC100	No
Hemiplegia/Hemiparesis	HCC103	No
Monoplegia, Other Paralytic Syndromes	HCC104	No
Atherosclerosis of the Extremities with Ulceration or Gangrene	HCC106	No
Vascular Disease with Complications	HCC107	No
Vascular Disease	HCC108	No
Cystic Fibrosis	HCC110	No
Chronic Obstructive Pulmonary Disease	HCC111	No
Fibrosis of Lung and Other Chronic Lung Disorders	HCC112	No
Aspiration and Specified Bacterial Pneumonias	HCC114	No
Pneumococcal Pneumonia, Empyema, Lung Abscess	HCC115	No
Proliferative Diabetic Retinopathy and Vitreous Hemorrhage	HCC122	No
Exudative Macular Degeneration	HCC124	No
Dialysis Status	HCC134	No
Acute Renal Failure	HCC135	No
Chronic Kidney Disease, Stage 5	HCC136	No
Chronic Kidney Disease, Severe (Stage 4)	HCC137	No
Pressure Ulcer of Skin with Necrosis Through to Muscle, Tendon, or Bone	HCC157	Yes
Pressure Ulcer of Skin with Full Thickness Skin Loss	HCC158	Yes
Chronic Ulcer of Skin, Except Pressure	HCC161	Yes
Severe Skin Burn or Condition	HCC162	Yes
Severe Head Injury	HCC166	Yes
Major Head Injury	HCC167	Yes
Vertebral Fractures without Spinal Cord Injury	HCC169	Yes
Hip Fracture/Dislocation	HCC170	No
Traumatic Amputations and Complications	HCC173	No
Complications of Specified Implanted Device or Graft	HCC176	No
Major Organ Transplant or Replacement Status	HCC186	No
Artificial Openings for Feeding or Elimination	HCC188	Yes
Amputation Status, Lower Limb/Amputation Complications	HCC189	No

ATTACHMENT B: MEDICARE SUPPLEMENT OPTIMIZATION MODEL ALGORITHM - EXHIBIT DEMONSTRATION AND IMPACT SCORE

Year	1	2	3	4	5	6	7	8	9	10	Present Value
Baseline Expectations											
Policies Sold	30,000										
Premium	$42,398,220	$38,200,796	$34,418,917	$31,011,445	$27,941,312	$25,175,122	$22,682,785	$20,437,189	$18,413,907	$16,590,930	$232,371,205
Claims	24,137,293	23,248,526	21,891,531	21,470,763	19,345,157	17,429,987	15,704,418	14,149,681	12,748,862	11,486,725	151,184,076
Commission	10,599,555	9,009,622	7,658,179	6,509,452	5,533,034	4,703,079	1,599,047	1,359,190	1,155,311	-	42,178,840
Administrative Expenses	5,400,000	3,060,000	2,601,000	2,210,850	1,879,223	1,597,339	1,357,738	1,154,078	980,966	833,821	18,158,113
% Premium Expense	**1,059,956**	**955,020**	**860,473**	**775,286**	**698,533**	**629,378**	**567,070**	**510,930**	**460,348**	**414,773**	**5,809,280**
Net Gain	$1,201,417	$1,927,629	$1,407,735	$45,094	$485,365	$815,339	$3,454,512	$3,263,311	$3,068,420	$3,855,611	$15,040,896
% of Premium											
Claims	56.9%	60.9%	63.6%	69.2%	69.2%	69.2%	69.2%	69.2%	69.2%	69.2%	65.1%
Commission	25.0%	23.6%	22.2%	21.0%	19.8%	18.7%	7.0%	6.7%	6.3%	0.0%	18.2%
Administrative Expenses	12.7%	8.0%	7.6%	7.1%	6.7%	6.3%	6.0%	5.6%	5.3%	5.0%	7.8%
% Premium Expense	**2.5%**	**2.5%**	**2.5%**	**2.5%**	**2.5%**	**2.5%**	**2.5%**	**2.5%**	**2.5%**	**2.5%**	**2.5%**
Net Gain	2.8%	5.0%	4.1%	0.1%	1.7%	3.2%	15.2%	16.0%	16.7%	23.2%	6.5%
Alternative Screening											
Policies Sold	28,724										
Premium	$40,594,516	$36,575,659	$32,954,669	$29,692,157	$26,752,633	$24,104,122	$21,717,814	$19,567,751	$17,630,543	$15,885,120	$222,485,676
Claims	22,182,814	21,384,729	20,189,103	19,856,853	17,891,025	16,119,814	14,523,952	13,086,081	11,790,559	10,623,293	139,527,102
Commission	10,148,629	8,626,335	7,332,385	6,232,527	5,297,648	4,503,001	1,531,020	1,301,367	1,106,162	-	40,384,469
Administrative Expenses	5,400,000	3,060,000	2,601,000	2,210,850	1,879,223	1,597,339	1,357,738	1,154,078	980,966	833,821	18,158,113
% Premium Expense	**1,014,863**	**914,391**	**823,867**	**742,304**	**668,816**	**602,603**	**542,945**	**489,194**	**440,764**	**397,128**	**5,562,142**
Net Gain	$1,848,210	$2,590,204	$2,008,315	$649,622	$1,015,922	$1,281,366	$3,762,159	$3,537,032	$3,312,093	$4,030,877	$18,853,850
% of Premium											
Claims	52.3%	56.0%	58.7%	64.0%	64.0%	64.0%	64.0%	64.0%	64.0%	64.0%	60.0%
Commission	23.9%	22.6%	21.3%	20.1%	19.0%	17.9%	6.7%	6.4%	6.0%	0.0%	17.4%
Administrative Expenses	12.7%	8.0%	7.6%	7.1%	6.7%	6.3%	6.0%	5.6%	5.3%	5.0%	7.8%
% Premium Expense	**2.4%**	**2.4%**	**2.4%**	**2.4%**	**2.4%**	**2.4%**	**2.4%**	**2.4%**	**2.4%**	**2.4%**	**2.4%**
Net Gain	4.4%	6.8%	5.8%	2.1%	3.6%	5.1%	16.6%	17.3%	18.0%	24.3%	8.1%
Net Gain Impact	**$3,812,954**										
Impact per initial policies sold	**$127.10**										