

2019 Underwriting Issues & Innovation Seminar
July 28-30, 2019
Rosemont, IL

InsurTech

Presenters:
Maria Beaulieu
Jamie Hale
Maria Miller
Nicole Pollard

[SOA Antitrust Disclaimer](#)
[SOA Presentation Disclaimer](#)



Jamie Hale, CEO and Co-Founder

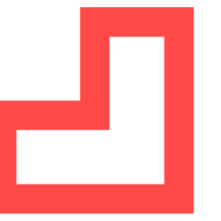
Our mission

To fund the resilience of families and communities
by closing the life insurance gap for 50 million families.

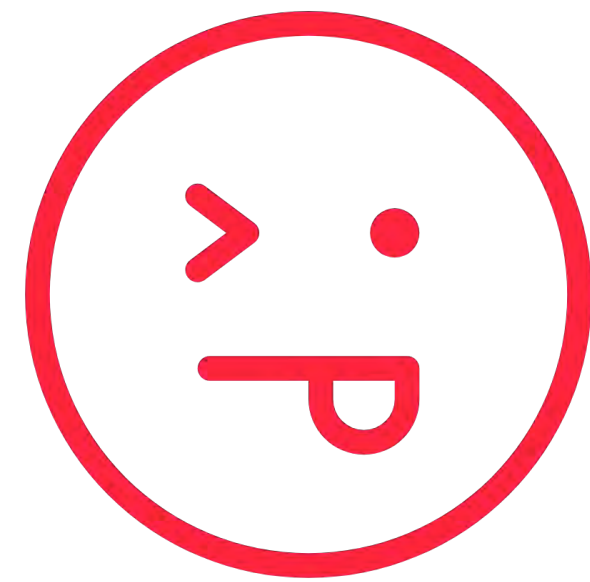


Our story is personal

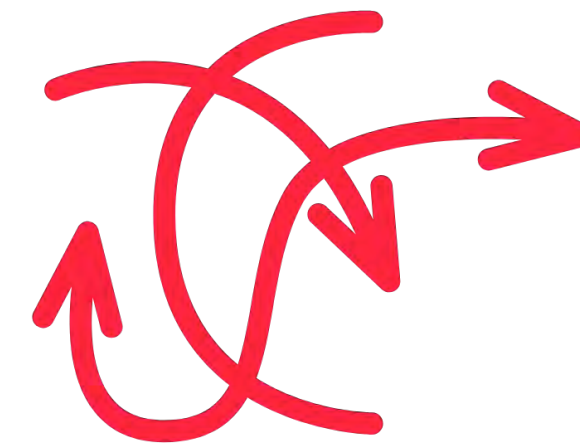
Solve the Customer Problem



Expensive



Unpleasant

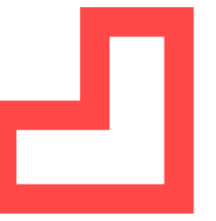


Complicated

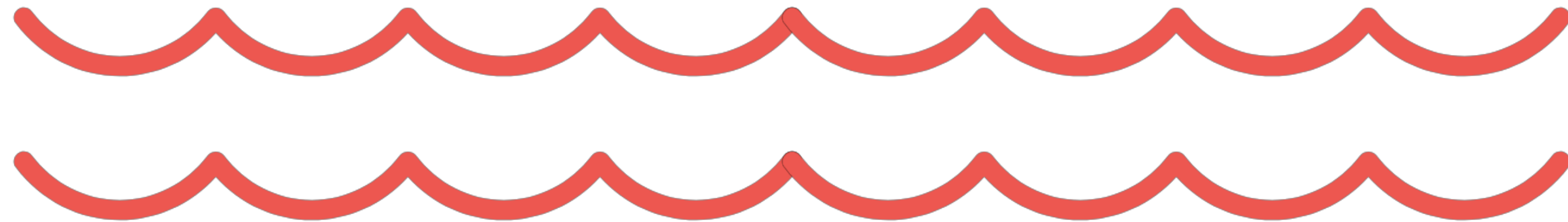


Slow


Product



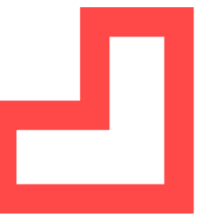
What the user sees and experiences



What's under the water line

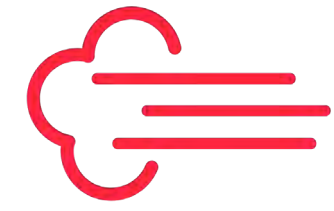


Average adult attention span

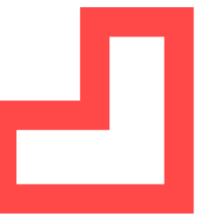


8

seconds



People are busy

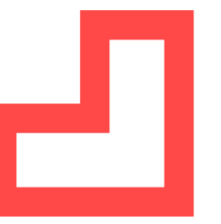


60%

outside business hours



Ladder customers are happy



84

NPS

2019 Underwriting Issues & Innovation Seminar

NICOLE POLLARD, DHA, MS, CSM, CSPO
MASSMUTUAL

July 29, 2019



SOCIETY OF ACTUARIES

Antitrust Compliance Guidelines

Active participation in the Society of Actuaries is an important aspect of membership. While the positive contributions of professional societies and associations are well-recognized and encouraged, association activities are vulnerable to close antitrust scrutiny. By their very nature, associations bring together industry competitors and other market participants.

The United States antitrust laws aim to protect consumers by preserving the free economy and prohibiting anti-competitive business practices; they promote competition. There are both state and federal antitrust laws, although state antitrust laws closely follow federal law. The Sherman Act, is the primary U.S. antitrust law pertaining to association activities. The Sherman Act prohibits every contract, combination or conspiracy that places an unreasonable restraint on trade. There are, however, some activities that are illegal under all circumstances, such as price fixing, market allocation and collusive bidding.

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While participating in all SOA in person meetings, webinars, teleconferences or side discussions, you should avoid discussing competitively sensitive information with competitors and follow these guidelines:

- **Do not** discuss prices for services or products or anything else that might affect prices
- **Do not** discuss what you or other entities plan to do in a particular geographic or product markets or with particular customers.
- **Do not** speak on behalf of the SOA or any of its committees unless specifically authorized to do so.
- **Do** leave a meeting where any anticompetitive pricing or market allocation discussion occurs.
- **Do** alert SOA staff and/or legal counsel to any concerning discussions
- **Do** consult with legal counsel before raising any matter or making a statement that may involve competitively sensitive information.

Adherence to these guidelines involves not only avoidance of antitrust violations, but avoidance of behavior which might be so construed. These guidelines only provide an overview of prohibited activities. SOA legal counsel reviews meeting agenda and materials as deemed appropriate and any discussion that departs from the formal agenda should be scrutinized carefully. Antitrust compliance is everyone's responsibility; however, please seek legal counsel if you have any questions or concerns.

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Topics to be Discussed

- MassMutual & Haven Life Partnership
 - The Agile Mindset
- Underwriting for Data Collection
 - Standardization
 - Protective Value
 - Behavioral Economics
 - Workforce of the Future



MassMutual & Haven Life Partnership

The MassMutual logo consists of three white dots of increasing size to the left of the word "MassMutual" in a white, bold, sans-serif font, all set against a dark blue rectangular background.

∴ MassMutual

The MassMutual Coverpath logo features the same three-dot icon and "MassMutual" text as above, but in dark blue on a light blue background. Below "MassMutual" is the word "Coverpath" in a smaller, dark blue, sans-serif font.

∴ MassMutual
Coverpath

The Haven Life logo is set against a solid blue square background. It features a white stylized icon of a house or a square with a notch on the left side, followed by the words "Haven" and "Life" stacked vertically in a white, bold, sans-serif font.

Haven
Life

The Agile Mindset

How **not to build** a minimum viable product



1



2



3



4

How **to build** a minimum viable product



1



2



3



4



5

Illustrations from <https://blog.crisp.se/2016/01/25/henrikkniberg/making-sense-of-mvp>

Underwriting for Data Collection

A new way to think about the Underwriting Process

EXAMPLES:

- Case routing to optimize skillsets and risk pooling
- Correlating medical impairments to underwriting manuals
- Documenting underwriting files for data interpretation
- Protective value at the click of a button
- Development of new underwriting workflows
- Underwriting talent development and recruitment

Underwriting for Data Collection

UPNT M3S | Details ▾ | M - [REDACTED] | \$1.15m · 10y · Waiver | [REDACTED] | 14 Documents | Pending Follow Up

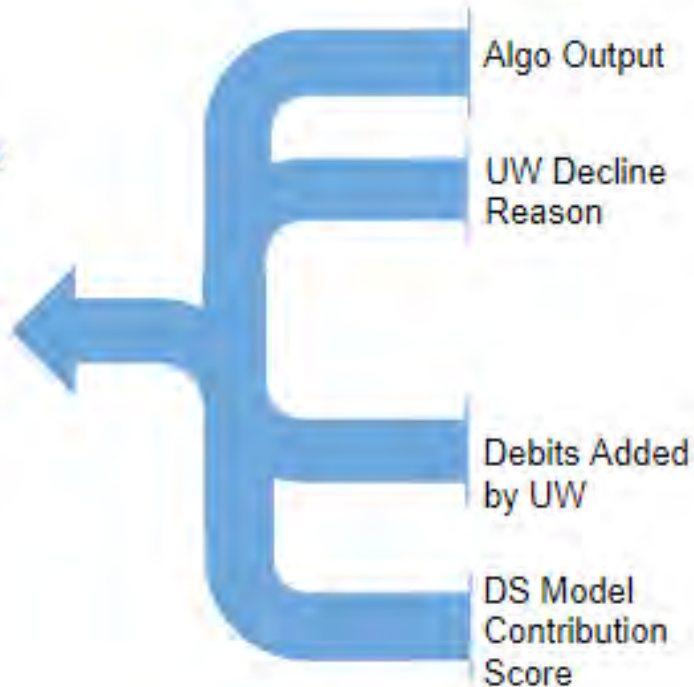
All Notes (5) Activity

Issue Category	Description	Status
MIB Hit	MIB Codes	DONE
Policy	Algorithmic policy · Face amount	DONE
Family History	Cancer*	IN PROGRESS
Other Medical	DI file # [REDACTED] pending *	IN PROGRESS
Rx	High-risk drugs · High-risk drugs or MIB hit	IN PROGRESS
Substance Abuse	Alcohol consumption	IN PROGRESS
Add Issue		

Underwriting for Data Collection

Use historical applicant data to understand when labs mattered

Did Labs Matter?



Underwriting for Data Collection

```
for i in range(500):
    labLimit = i
    key = 'fm3s_score_' + str(labLimit)

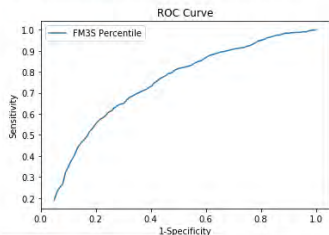
    fm3s_grped['pred_reqLabs'] = np.where((fm3s_grped['fm3s_score'] < 0) | (fm3s_grped['fm3s_score'] >= labLimit), 1,
    sensitivity = sum((fm3s_grped['pred_reqLabs'] == 1) & (fm3s_grped[labImpact] == 1)) / sum(fm3s_grped[labImpact] == 1)
    specificity = sum((fm3s_grped['pred_reqLabs'] == 0) & (fm3s_grped[labImpact] == 0)) / sum(fm3s_grped[labImpact] == 0)

    pred_results_dict[key] = {'model': 'fm3s_score', 'labLimit': labLimit, 'sensitivity': sensitivity, 'specificity': spec
```

```
In [301]: # Build dataset for ROC Curves
roc_df = pd.DataFrame.from_dict(pred_results_dict, orient = 'index').reset_index()
roc_df['invSpecificity'] = 1 - roc_df['specificity']
fm3s_score_df = roc_df.loc[roc_df['model'] == 'fm3s_score'].sort_values('labLimit')
fm3s_percentile_df = roc_df.loc[roc_df['model'] == 'fm3s_percentile'].sort_values('labLimit')
```

```
In [302]: # Plot ROC Curve
plt.plot(fm3s_percentile_df['invSpecificity'], fm3s_percentile_df['sensitivity'], label = 'FM3S Percentile')
# plt.plot(fm3s_score_df['invSpecificity'], fm3s_score_df['sensitivity'], label = 'FM3S Score')
plt.title('ROC Curves')
plt.xlabel('1-Specificity')
plt.ylabel('Sensitivity')
plt.legend()
```

Out[302]: <matplotlib.legend.Legend at 0xa81a0eld0>



```
# Labeling when labs are useful and high impact
labs_pclcy_grp['labsUseful'] = np.where(labs_pclcy_grp['Debit'] + labs_pclcy_grp['gate2Rule'] + labs_pclcy_grp['uwReason']
labs_pclcy_grp['labsHI'] = np.where(labs_pclcy_grp['Debit'] + labs_pclcy_grp['uwReason'] + labs_pclcy_grp['m3s_contrib'] >
# Grouping by final rate class and uatype
labs_uw_grp = labs_pclcy_grp
.groupby(['finalUWType', 'finalRateClassSimple'])
.agg({
    'policyNumber': 'nunique',
    'Debit': lambda x: np.where(x>0, 1, 0).sum(),
    'gate2Rule': lambda x: np.where(x>0, 1, 0).sum(),
    'uwReason': lambda x: np.where(x>0, 1, 0).sum(),
    'm3s_contrib': lambda x: np.where(x>0, 1, 0).sum(),
    'labsUseful': lambda x: np.where(x>0, 1, 0).sum(),
    'labsHI': lambda x: np.where(x>0, 1, 0).sum()
})
```

```
326]: # Group df to understand how often lab specific rules fired under each UW event
init_result_grp.reset_index()[['finalUWType', 'finalRateClassSimple', 'total_cnt']]
.merge(labs_uw_grp.reset_index(), how = 'left')
[['finalUWType', 'finalRateClassSimple', 'total_cnt', 'Debit', 'gate2Rule', 'uwReason', 'm3s_contrib',
'labsUseful', 'labsHI']]
```

326]:

	finalUWType	finalRateClassSimple	total_cnt	Debit	gate2Rule	uwReason	m3s_contrib	labsUseful	labsHI
0	Algorithmic	1	504	NaN	NaN	NaN	NaN	NaN	NaN
1	Algorithmic	2	103	NaN	NaN	NaN	NaN	NaN	NaN
2	Algorithmic	3	63	0.0	16.0	0.0	32.0	40.0	32.0
3	Algorithmic	4	13	0.0	5.0	0.0	0.0	5.0	0.0
4	Algorithmic	5	3	0.0	3.0	0.0	2.0	3.0	2.0
5	Manual	1	2779	NaN	NaN	NaN	NaN	NaN	NaN
6	Manual	2	766	2.0	172.0	0.0	22.0	189.0	24.0
7	Manual	3	1576	368.0	664.0	205.0	280.0	900.0	709.0
8	Manual	4	125	0.0	98.0	0.0	3.0	98.0	3.0
9	Manual	5	95	19.0	79.0	13.0	25.0	84.0	45.0
10	Manual	60	311	199.0	219.0	16.0	139.0	235.0	216.0

Underwriting for Data Collection

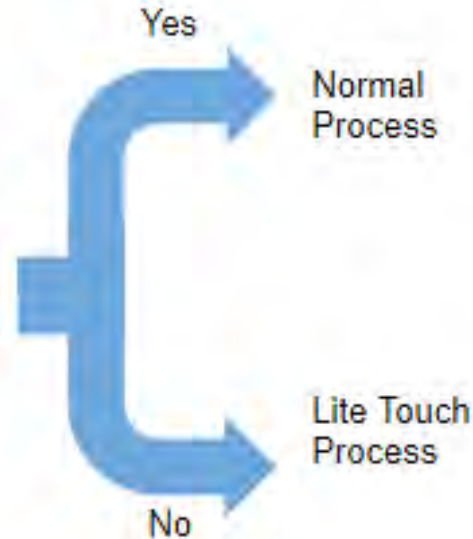
Use data received pre-lab to predict whether labs are impactful

Gate 0 Rules

- B00623 - Avocation
- B00024 - Felony
- B01006 - Heart Condition**
- B00620 - Family History
- B00291 - Financials
- B01308 - Blood Disorder / Immune System**
- B01408 - Brain / Neurological**
- B01704 - Respiratory**
- B00204 - General Medical
- driving_history - Driving
- .
- .
- .
- 290+ rules



Will Labs Matter?



Behavioral Economics

Learnings/Discussion points:

- Skill Training
 - Soft Skills
- Rapid Turn-around-time
 - Seconds, Minutes, Hours
- Live-case load challenges
 - 24/7 digital communication
- Removing the Advisor
 - Possible Friction Point



Illustration from CMU.edu

Behavioral Economics

Case File

MODELS CUSTOMER NON-MEDICAL MEDICAL ALL RESPONSES **REQUESTS (1)** ALGO

CURRENT REQUESTS

Follow Up

Status:

Ready

Sent by [REDACTED] May 22, 11:06 AM

Completed by [REDACTED] May 22, 11:40 AM

Thank you for being a loyal MassMutual customer! We see you have a few other files with us. We are ready to make an offer today, we just have one more question that came up due to this new application format you applied with. You answered 2 times per month to the following question on the application: How many times per month do you consume more than 3 alcoholic drinks in one day (one drink is approximately 12 ounces of beer, 5 ounces of wine or 1.5 ounces of spirits)? On these three occasions please advise the number of drinks (1 drink as defined above) you have: 5 or less drinks, 6-10, 6 or more drinks? Thank you! 3

The Workforce of the Future



Prosci® Fight Risk Model





**SOCIETY OF
ACTUARIES®**