Claims Scoring Models

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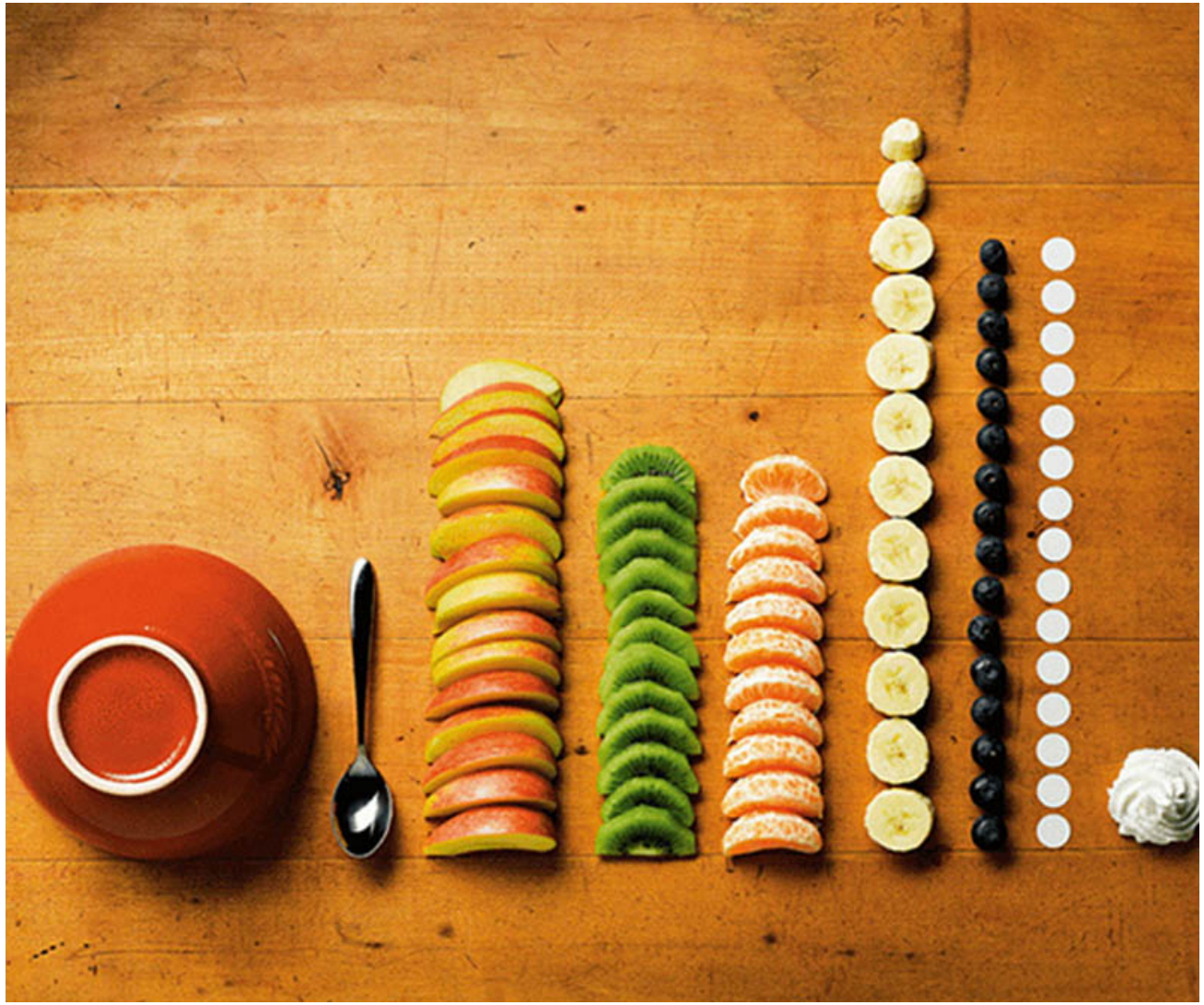

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Why are we not winning blue collar schemes?
What is hiding in all of our data?
Is our claims team as effective as it could be?
Why do we win schemes with more mental illness claims?
Can we automate our manual processes and spend more time on important tasks?

Opportunities in claim management

Consistent service delivery

Claim scoring helps case managers ensure that claimants get the assistance they need, when they need it, to return to work as soon as possible.

Effectively balanced workloads

High volume of claims leads to missed opportunities.
Claim scoring facilitate weighted workload allocation.

Lower Combined Ratio through reduced claims costs and operational expenses

Optimized claim assignment

Each claim requires different effort and skills to manage.
Claims scoring facilitate optimal assignment of claims.

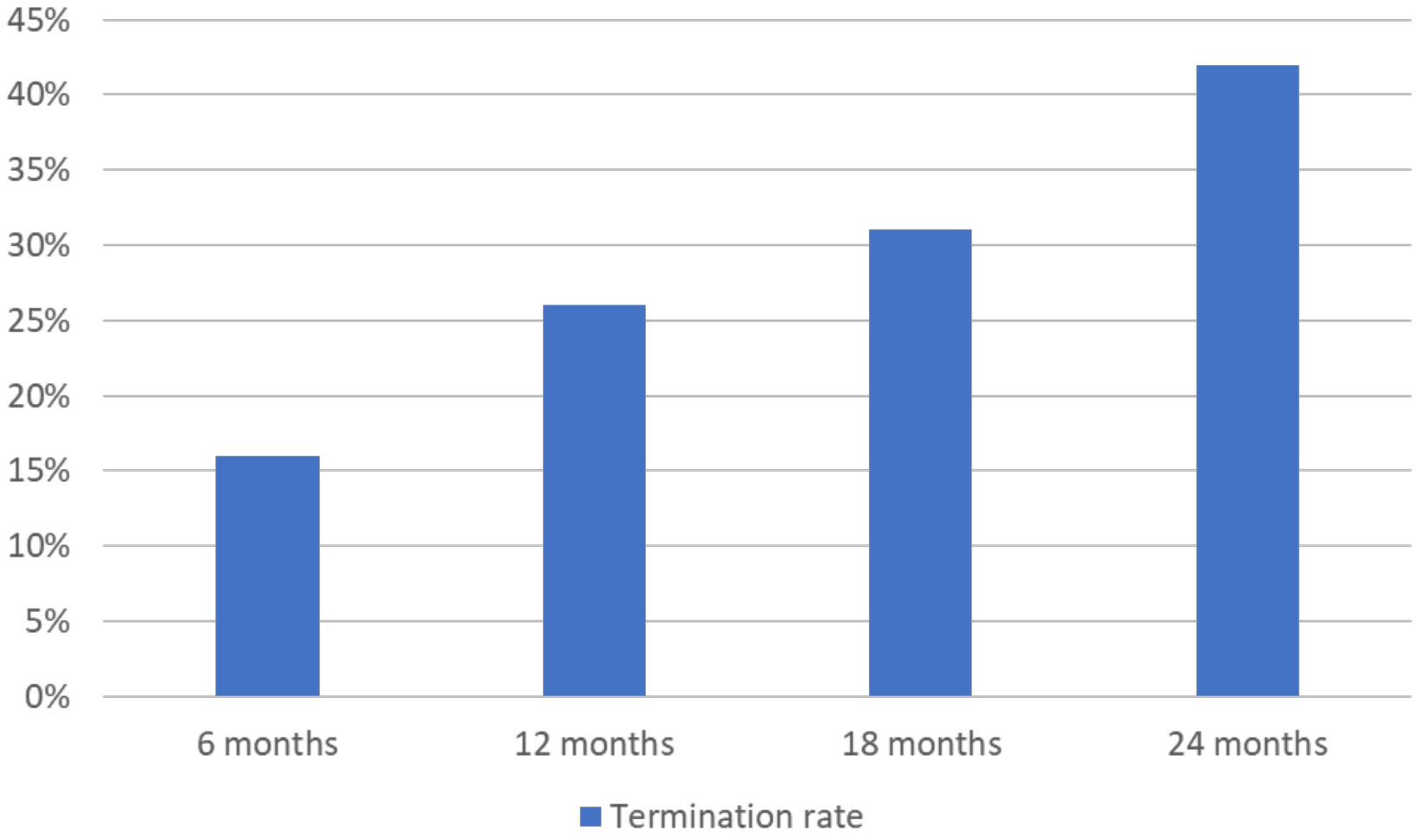
Identified opportunities for change/ adjustment

Observing changes in scores over time allows early identification of trends and changes in business mix.

Case study

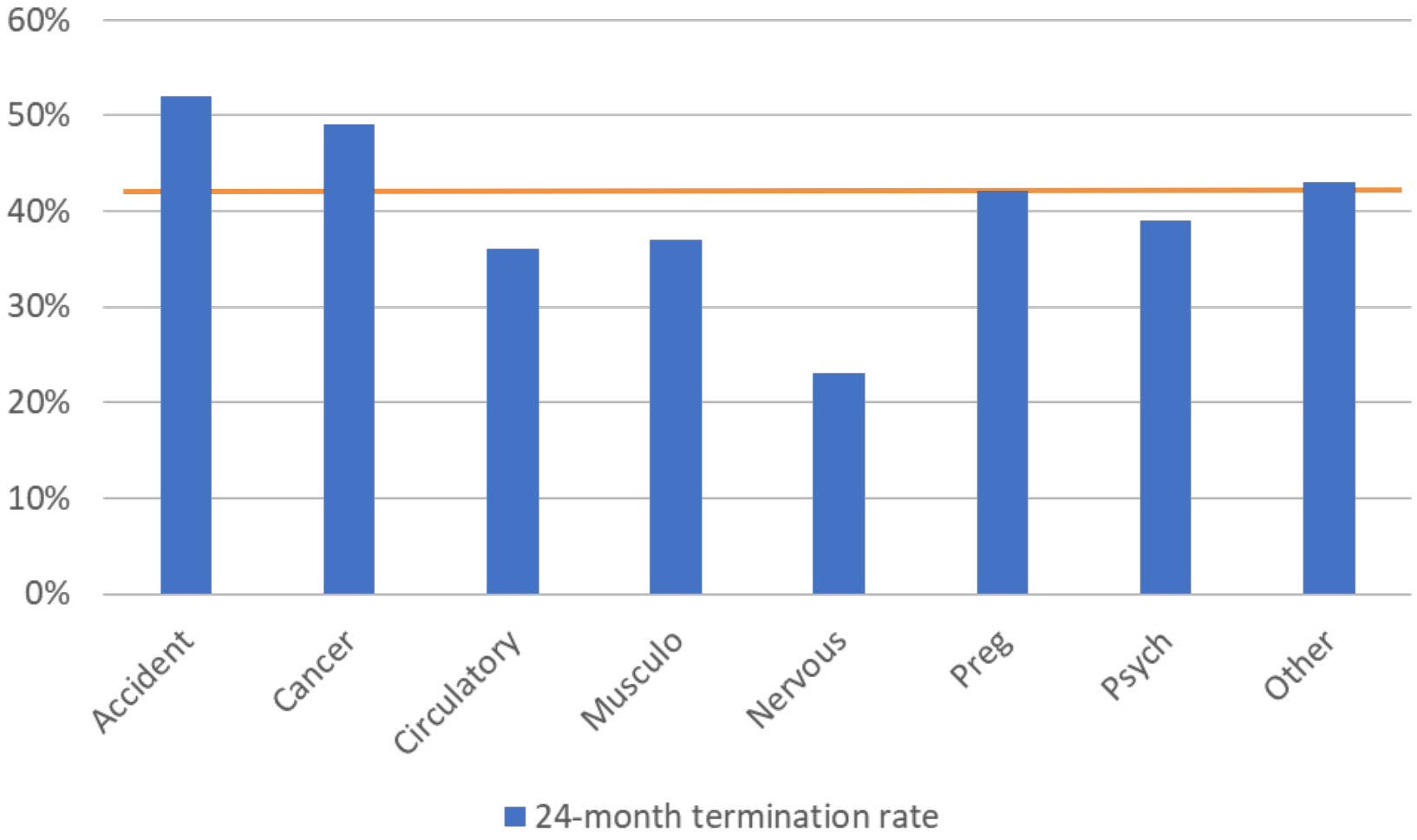
Long term disability claims – observed patterns in termination rates

Observed termination rates by duration



T24 by claim inception year

T24 by diagnostic category



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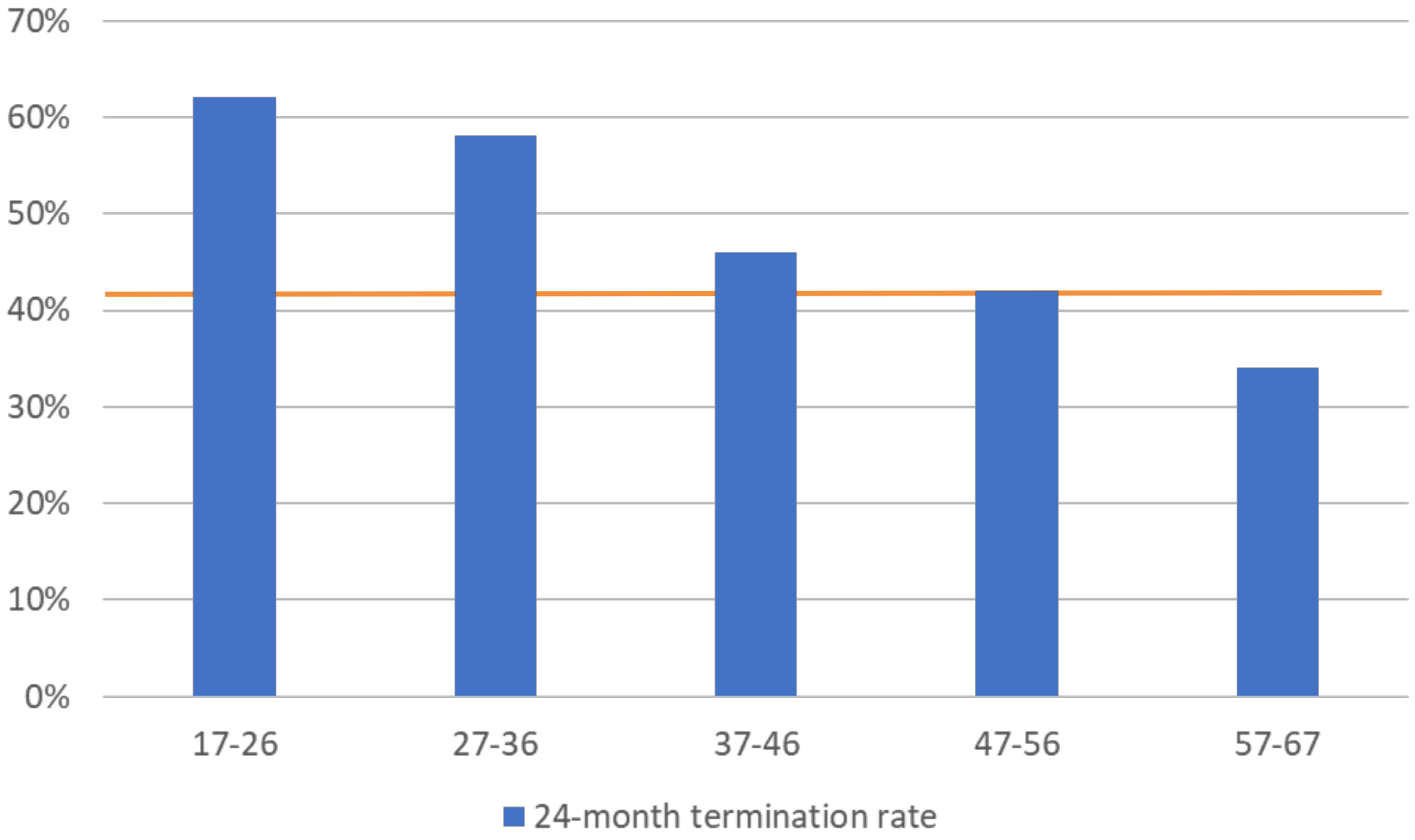
T24 by claimant age



Model development

Models learn from historical patterns

Model Input	To train the models we used historical claims of Employer X
Model Target	We defined target event “Return to Work” (RTW) as claim termination for a reason compatible with the claimant’s ability to return to work
Model Output	Algorithms to predict RTW within pre-defined timeframes based on claim attributes

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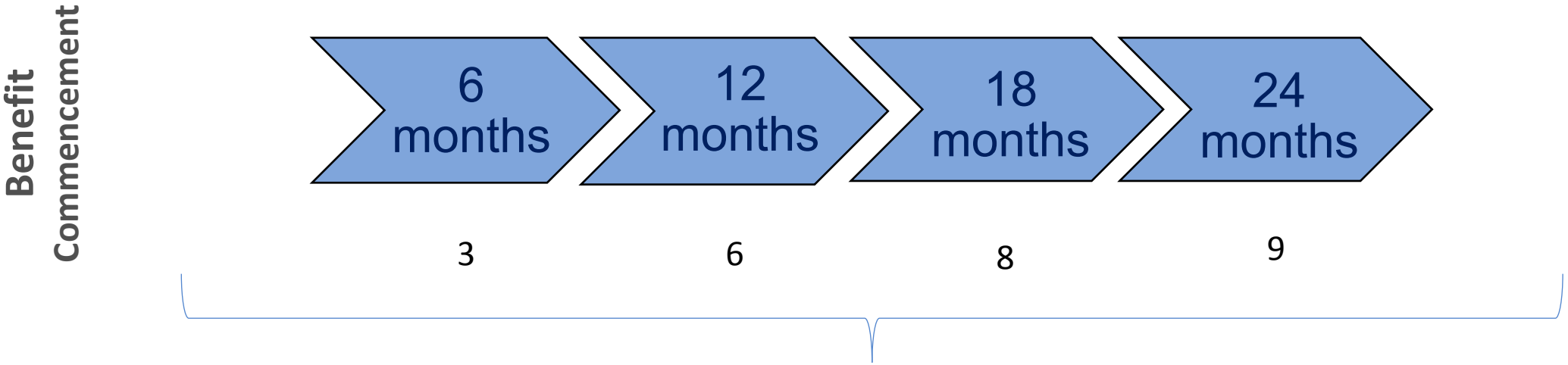
Predicted timeframes

Models were built to calculate the probability of return to work within 6, 12, 18, and 24 months relative to benefit commencement date.

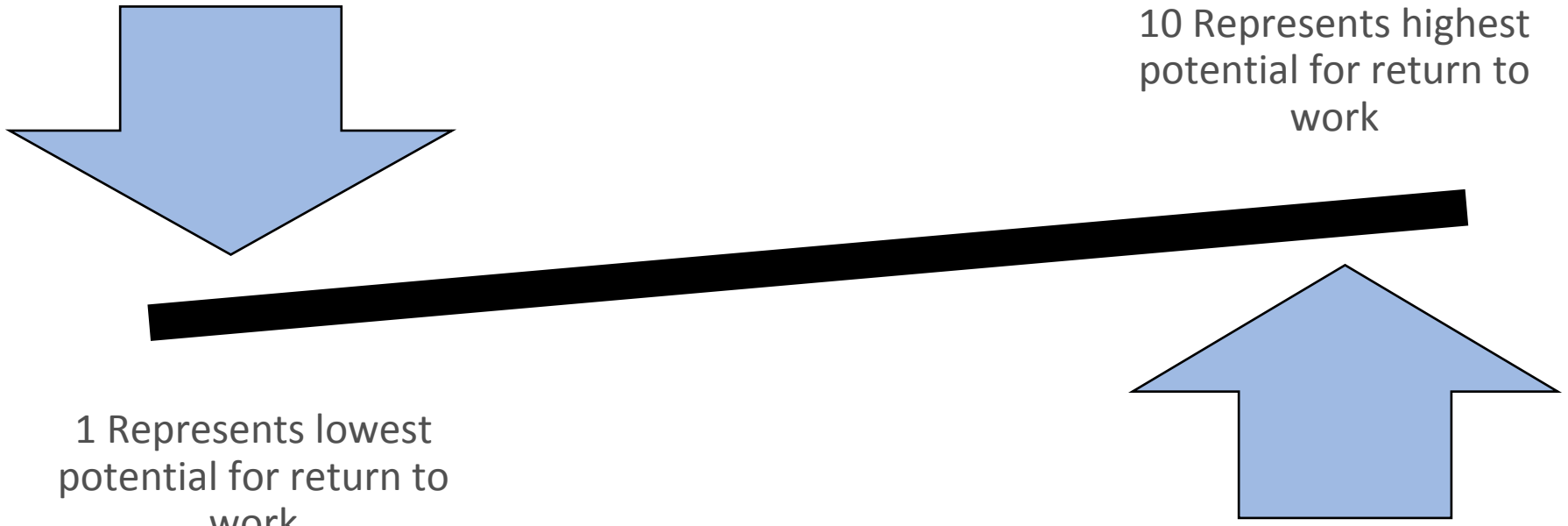
For simplicity, each probability is converted to 1-10 score.



Score reflects probability of RTW at each timeframe

Claim scores

Based on its specific attributes, a claim will be assigned a score between 1 and 10.



Score and corresponding average probability of RTW:

1	2	3	4	5	6	7	8	9	10
5%	15%	25%	35%	45%	55%	65%	75%	85%	95%

Model performance

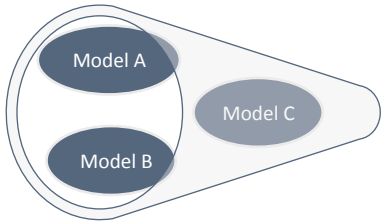
Historical Claims
(10K Claim Records)

20% of Claims

Validation Sample

Reveal observed outcomes (RTW) and compare to predicted scores.

80% of Claims



Apply predictive algorithms

Ensemble model

PREDICTIVE ALGORITHMS

Claim #

Score06
Score12
Score18
Score24

Observed Outcome (RTW status and timing)

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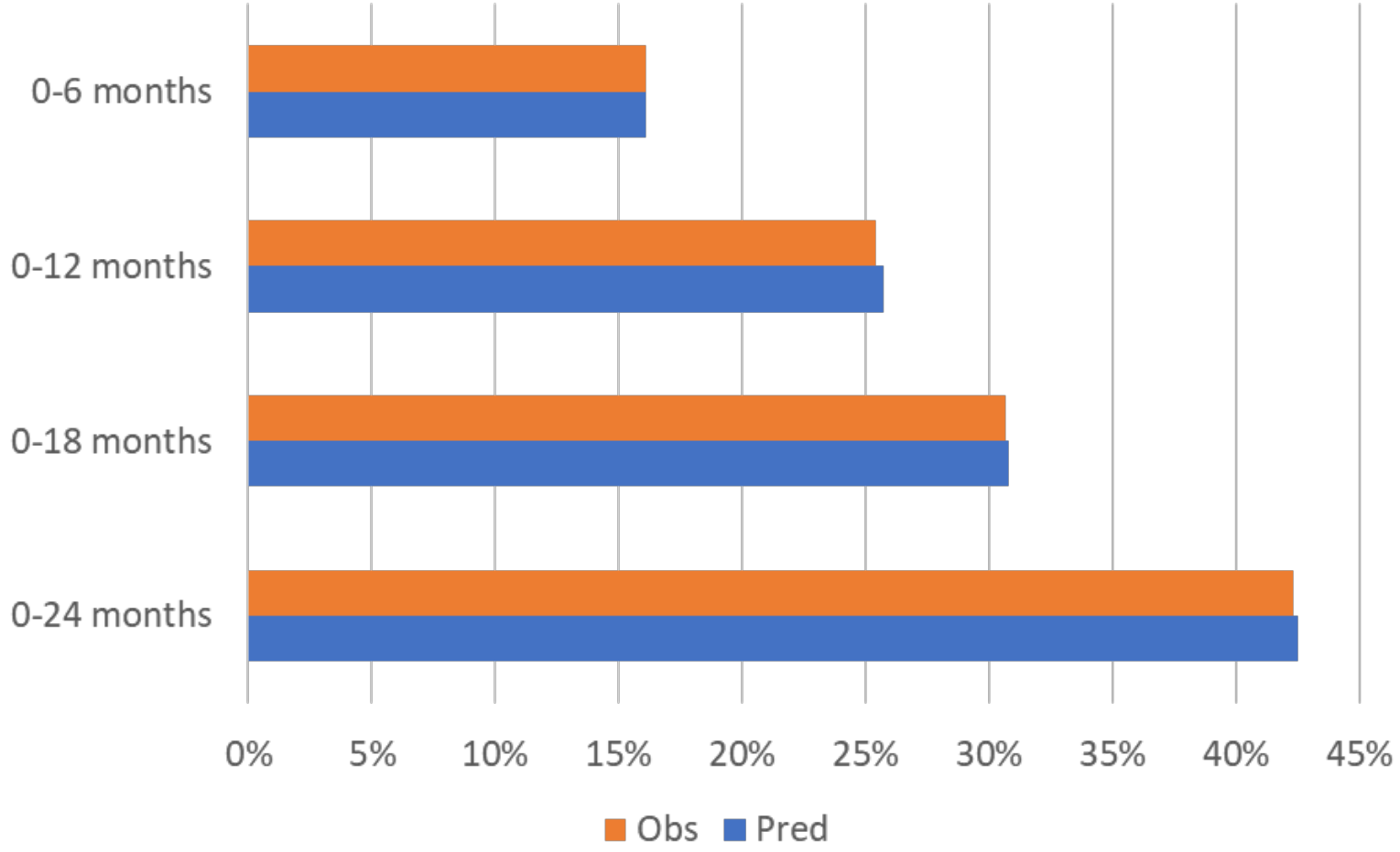
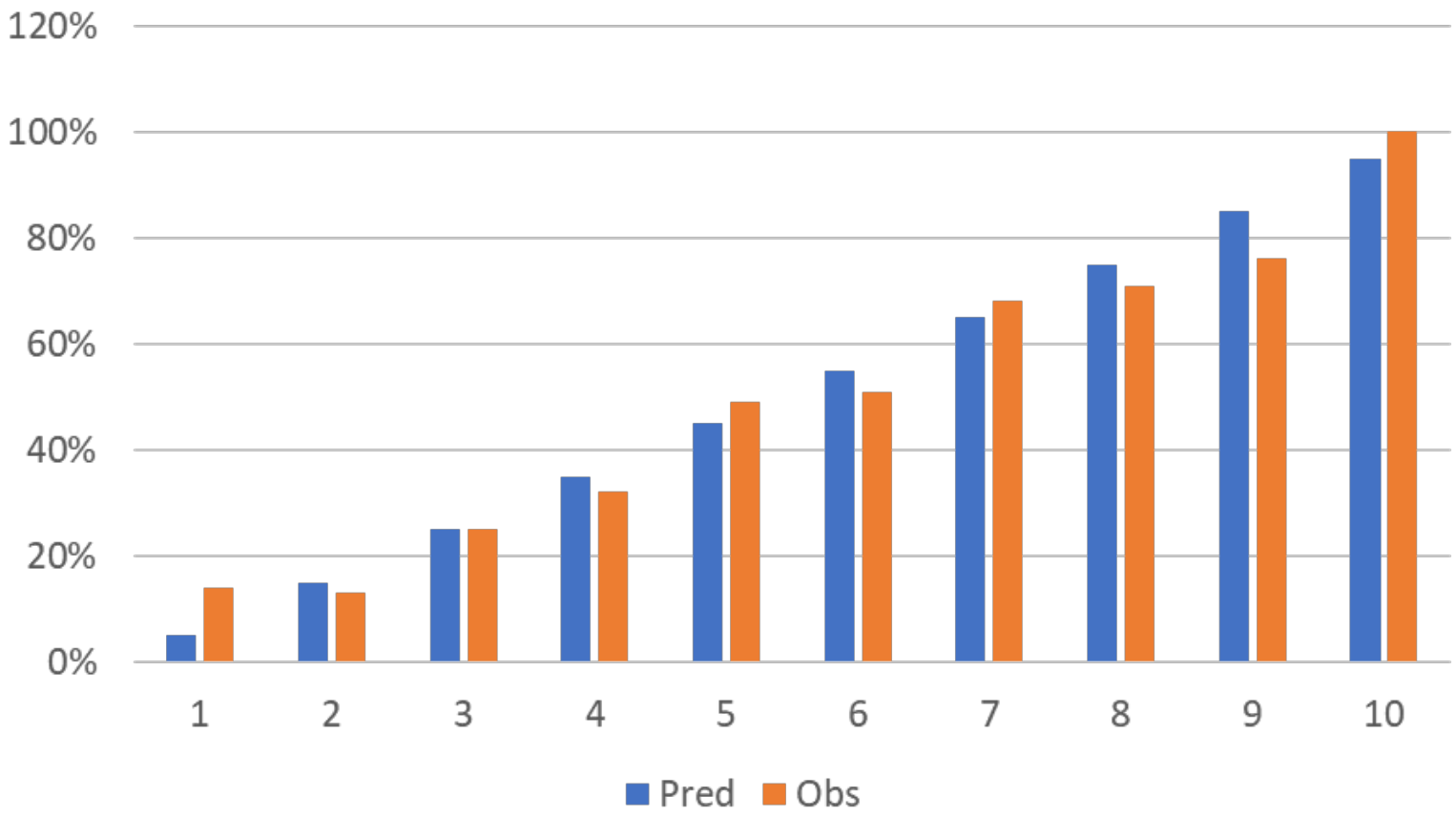
Observed vs predicted RTW

Validation sample



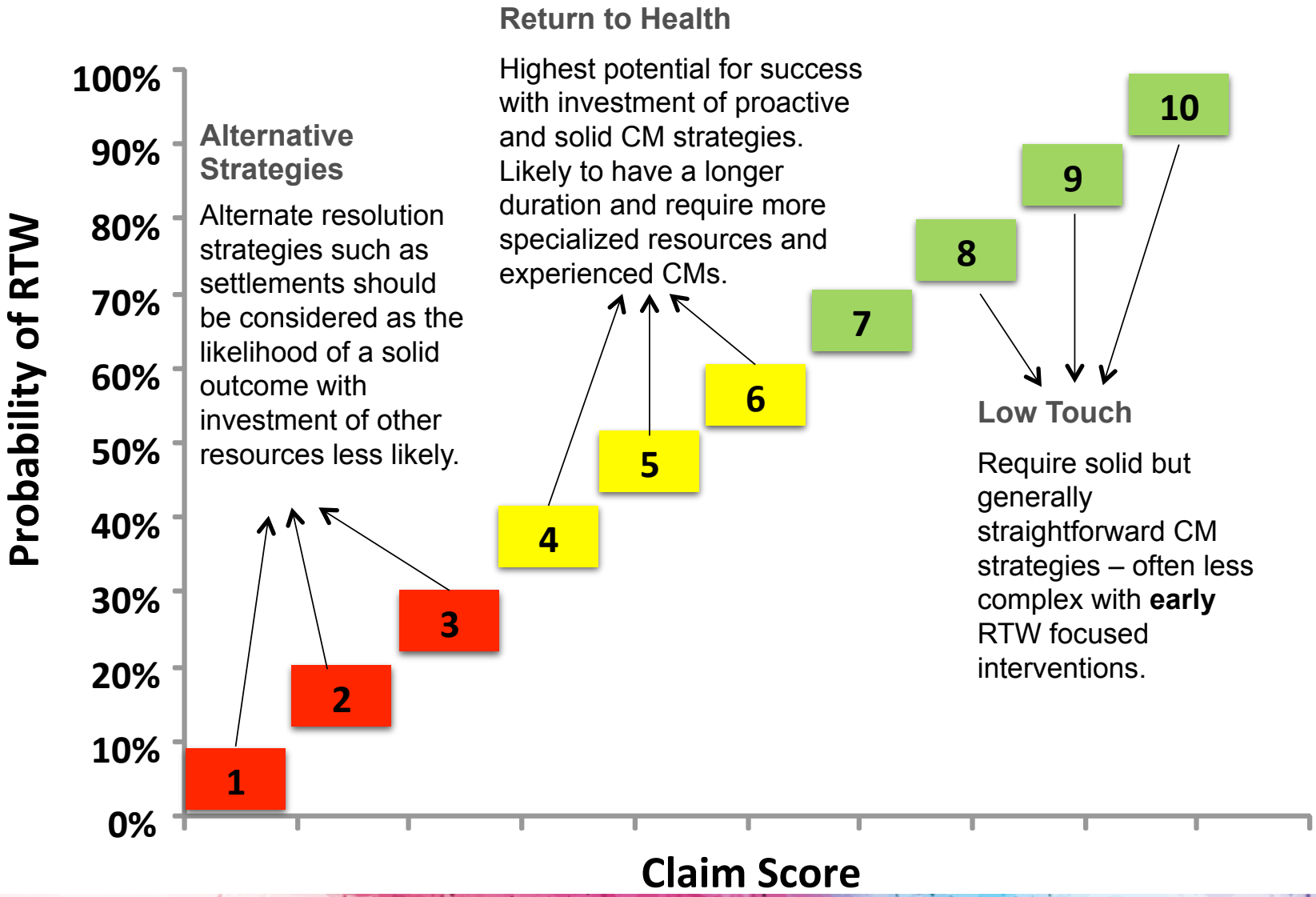
Observed vs predicted RTW24

Validation sample



Scores Usage

Segmenting new claims



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Examples of scored claims

Score24 categorization

Scoring Group	Claim Number	Benefit Date	Age at DOD	EP	Diagnosis	Score06	Score12	Score18	Score24	Duration (mths)
"Low Touch" Score24 of 7 or more	45784	1/1/2019	35	90	Osteomyelitis	4	7	8	**9**	2-3m
	78645	12/27/2018	37	90	Injury of unspecified body region	5	8	8	**9**	3-4m
	87475	12/14/2018	54	30	Fracture of lower leg, including ankle	7	9	9	**9**	3-4m
"Return to Health" Score24 of 4 to 6	63254	11/8/2018	54	90	Dislocation, sprain and strain of joints and ligaments of knee	3	5	5	**6**	4-5m
	95158	10/15/2018	59	90	Injury of unspecified body region	2	6	6	**6**	5-6m
	74147	10/18/2018	56	90	Fracture of lumbar spine and pelvis	2	5	5	**6**	5-6m
"Alternative Strategy" Score24 of 1 to 3	35654	12/18/2018	45	90	Other chronic obstructive pulmonary disease	1	3	3	**3**	3-4m
	75874	1/26/2019	63	90	Malignant neoplasm of brain	1	2	2	**2**	2-3m
	95488	9/19/2018	52	90	Multiple sclerosis	1	1	1	**1**	6-7m

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Claim opportunity report

Examples of claims approaching predicted duration: Proactive claim management

Claim Number	Benefit Date	Age at DOD	EP	Diagnosis	Score06	Score12	Score18	Score24	Duration (mths)
Approach duration of 12 months with Score12 of 7 or higher									
14553	6/27/2018	61	60	Fracture of lower leg, including ankle	4	8	8	8	9-10m
54558	4/5/2018	61	90	Fracture of foot~ unspecified	5	7	7	7	11-12m
Approach duration of 24 months with Score24 of 7 or higher									
98587	5/18/2017	50	90	Fracture of upper end of tibia	7	7	7	9	22-23m
87885	4/16/2017	50	90	Fracture at wrist and hand level	5	6	6	8	23-24m

Claim opportunity report

Examples of claims beyond predicted duration : Reactive claim management

Claim Number	Benefit Date	Age at DOD	EP	Diagnosis	Score06	Score12	Score18	Score24	Duration (mths)
95855	2/19/2018	38	90	Inguinal hernia	7	7	7	8	13-14m
45488	2/17/2018	50	90	Fracture of lower leg~ including ankle	7	8	8	9	14-15m
Beyond duration of 24 months with Score24 of 7 or higher									
65954	6/9/2016	43	90	Eating disorders	3	5	6	7	2-3yr
35674	3/3/2015	53	90	Fracture of lower leg~ including ankle	6	8	8	9	4-5yr

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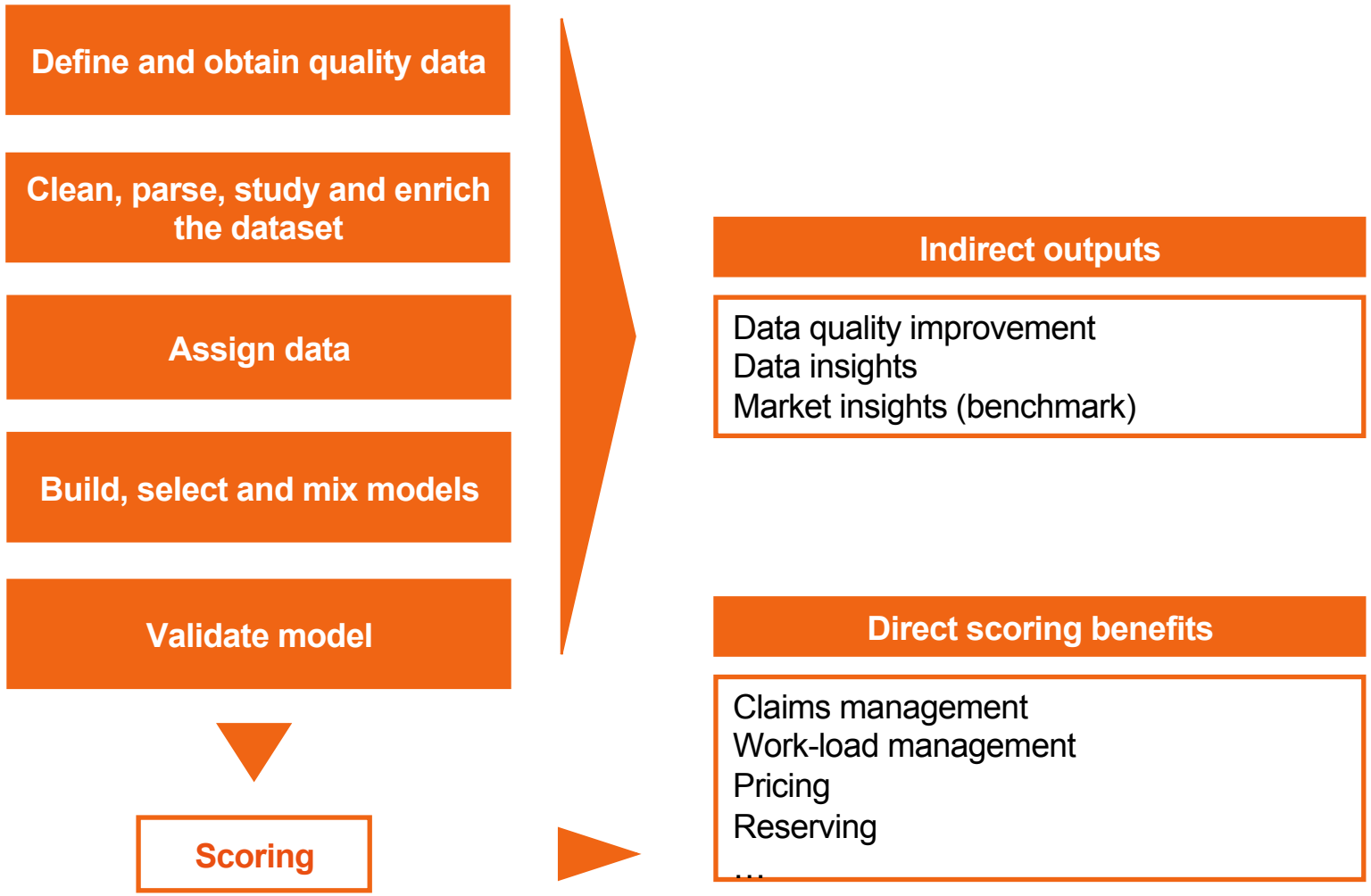
Approach Summary and Key Outcomes

From raw claims data to valuable insights



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Questions?