Weekly Capstone Update Meeting

Nov 17 2022

PA Dept. of Labor & Industry + CMU

Goals for today

- Discuss completed this past week
- Discuss next few weeks

Completed this past week

November/December

23	Sprint 4
30	Sprint 5
6	Sprint 6
13	Sprint 7
20	Finalize Build & Break

- Assigning severity
  - Implemented missing medical costs
  - Implemented new severity assignment using medical costs
- Work to implement exporting predictions
- Updated PowerBI Report

Assigning severity

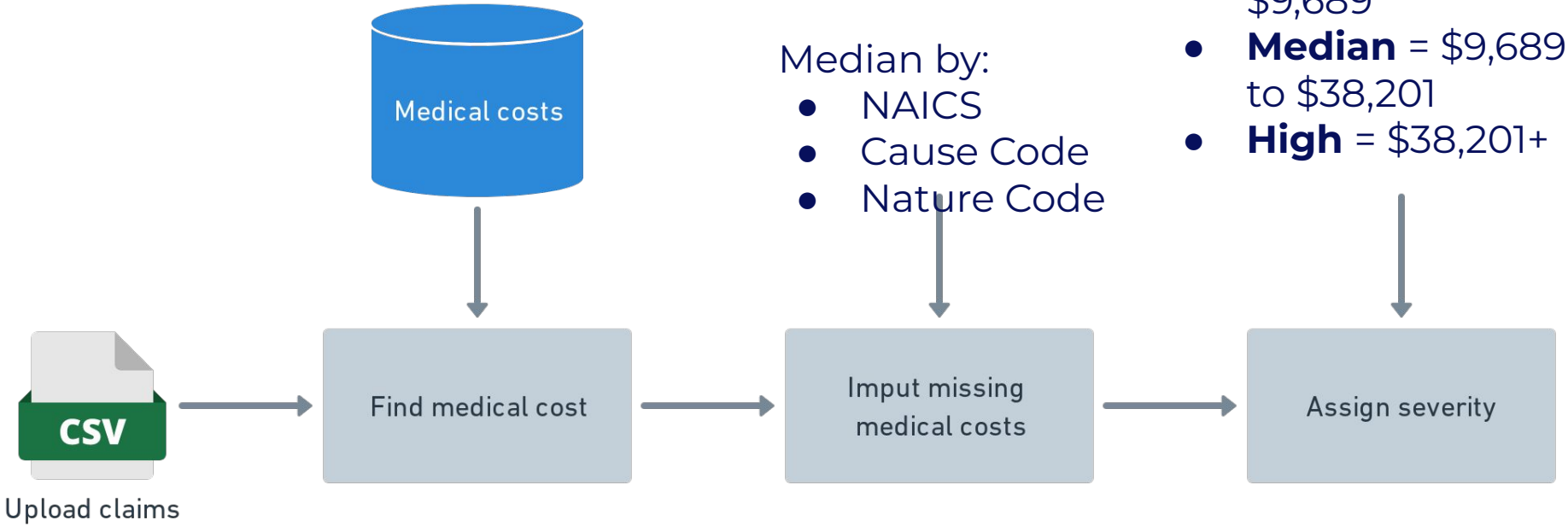
New upload flow

Jenks breaks:

- **Low** = $0 to $9,689
- **Median** = $9,689 to $38,201
- **High** = $38,201+

Median by:

- NAICS
- Cause Code
- Nature Code



Imputing with the median costs

	INJURY_CAUSE_CD	INJURY_NATURE_CD	Median Amount Paid
0	1	1	260.385
1	1	4	418.710
2	1	7	477.780
3	1	10	190.875
4	1	25	298.170
5	1	28	947.980
6	1	30	213.395
7	1	34	16891.160
8	1	36	760.945
9	1	37	286.265
10	1	40	271.070
11	1	42	355.700
12	1	43	676.840
13	1	52	127.615
14	1	54	1138.005
15	1	58	590.470
16	1	59	262.380
17	1	65	392.320
18	1	66	280.850

Cause = Chemicals
Nature = Fracture

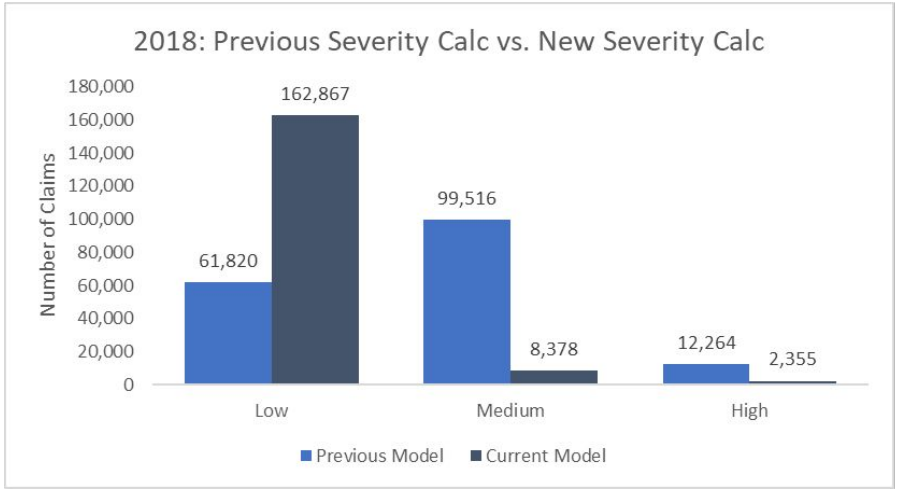
Missing value = $947.98

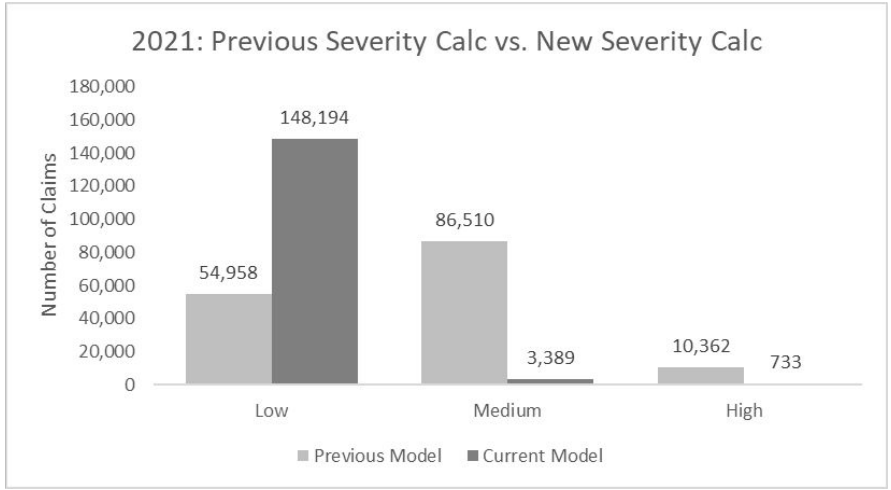
Before vs. after

For both sample years:

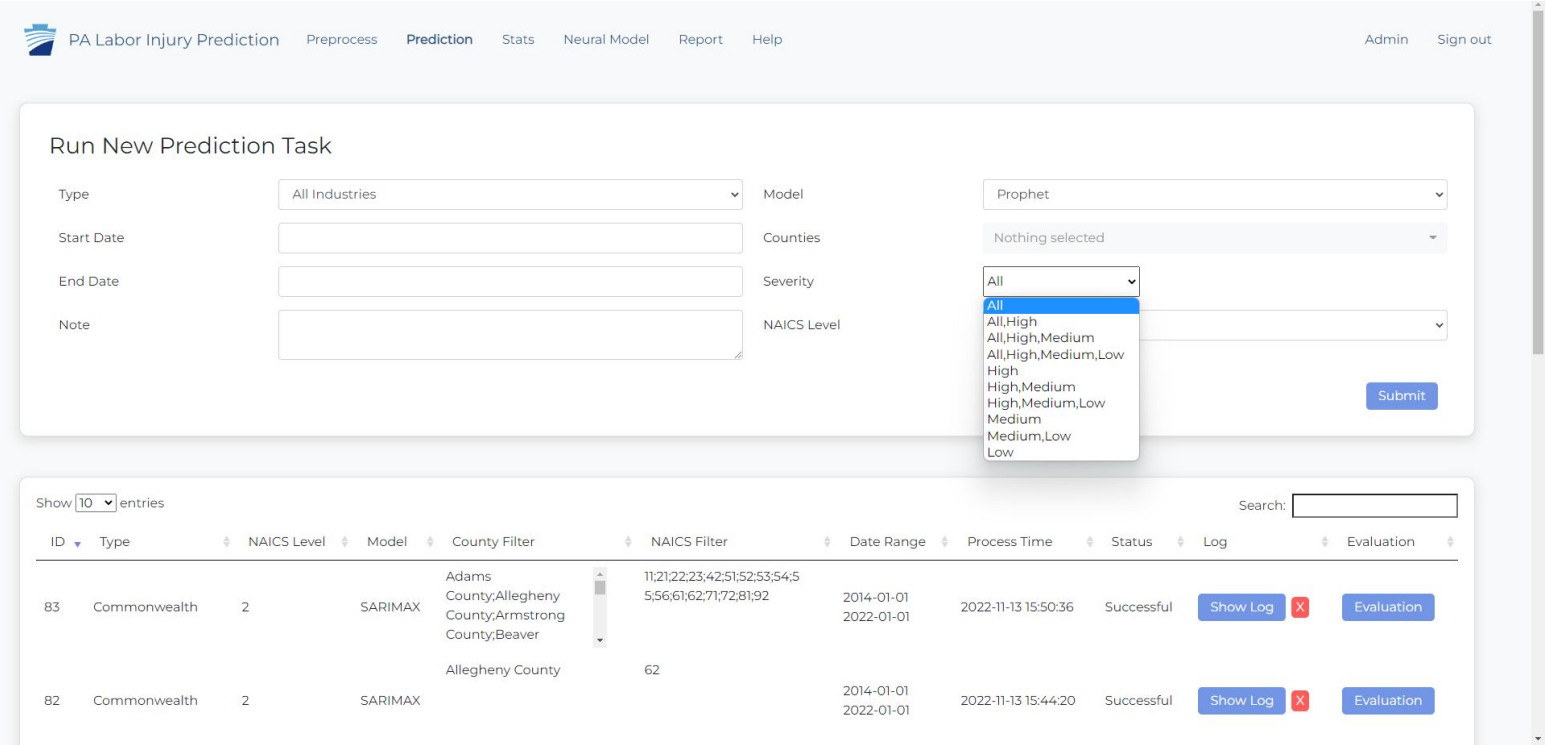
The new severity calculation pushes claims away from “high” severity based on medical cost information

Will enable team to more effectively target “high” severity NAICS or regions





Select to predict injury rates by severity



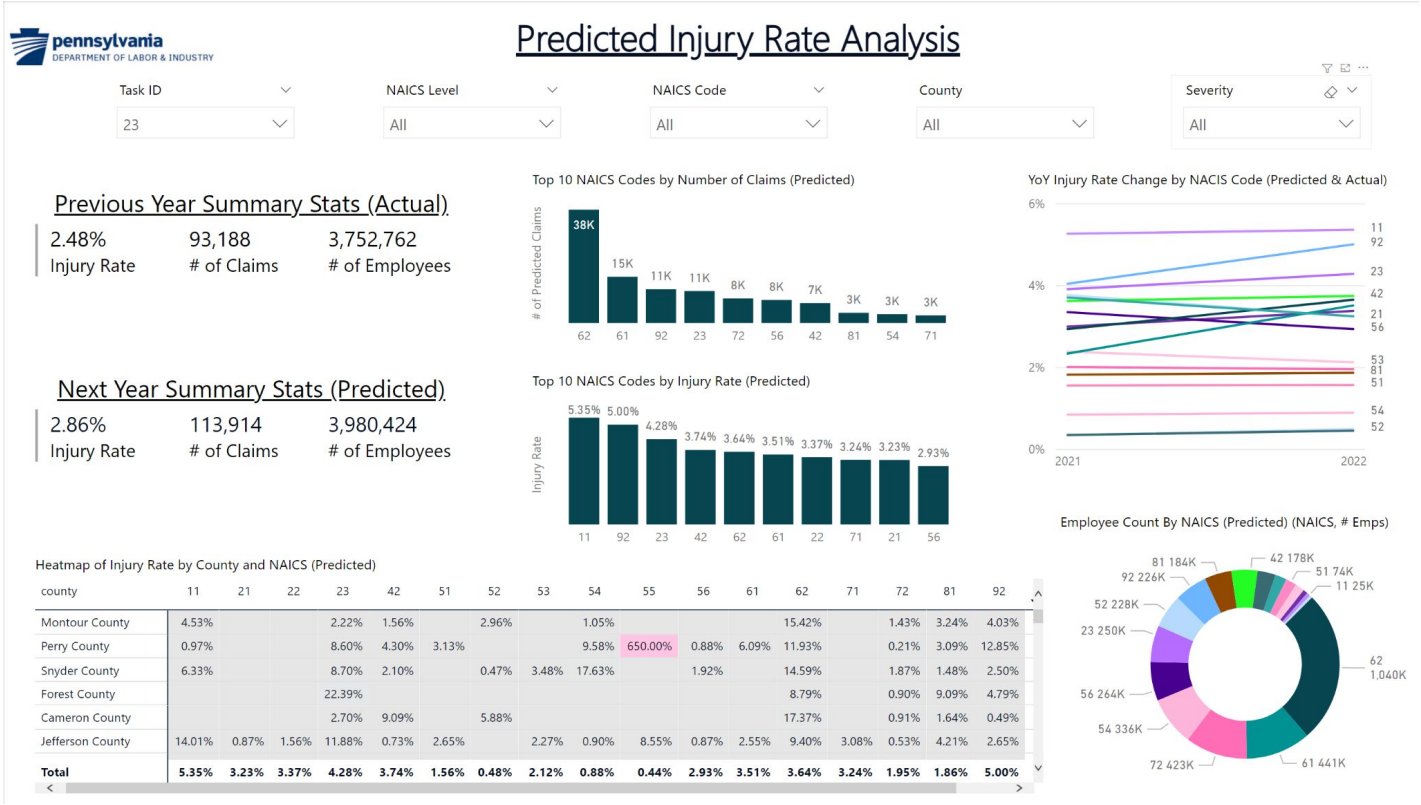
Exporting prediction results

Export prediction results

- Researched about the CSS syntax
- Added a new column for export button in prediction page
- Tested with the existing file directory
- Continuing next week

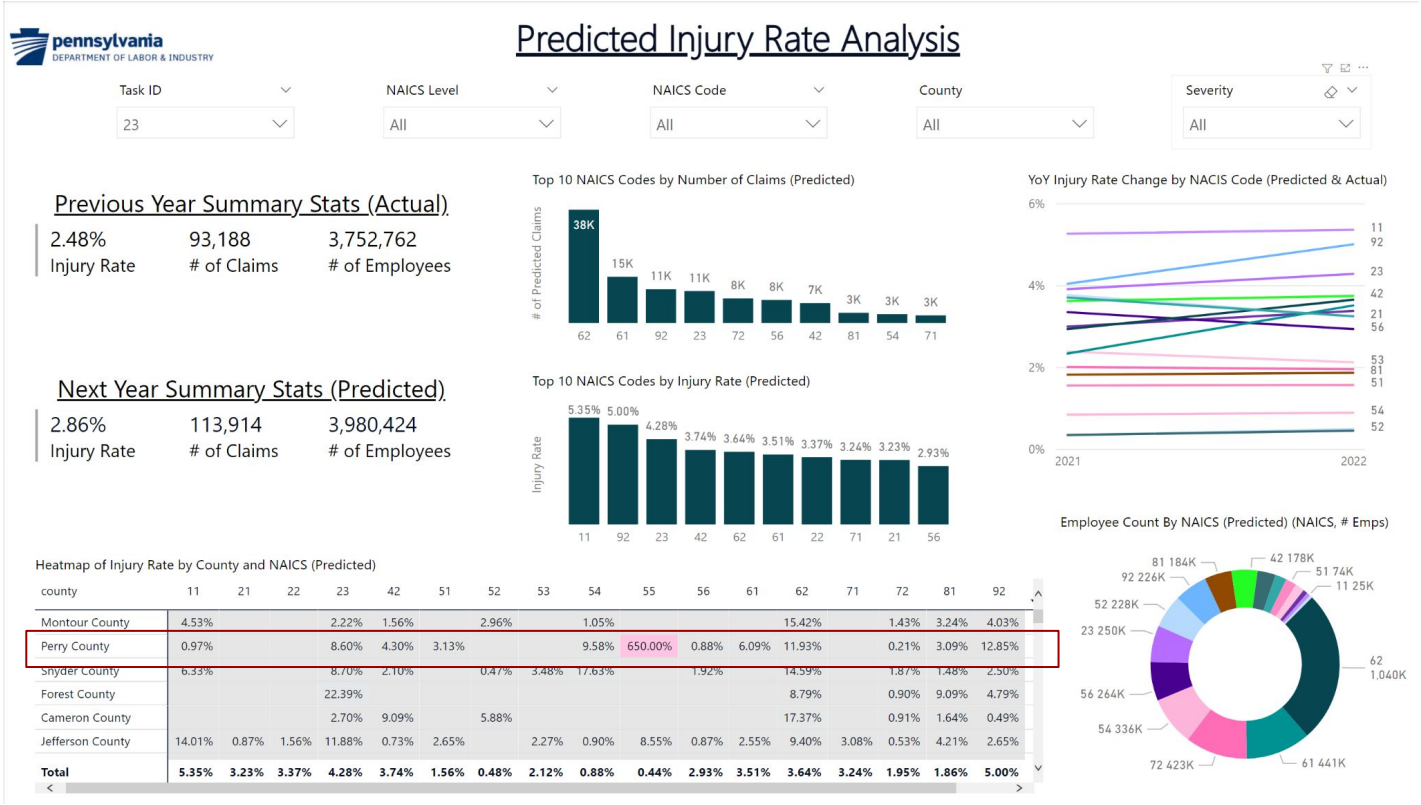
Updating PowerBI for easy analysis

Analyzing predicted injury rates



county	11	21	22	23	42	51	52	53	54	55	56	61	62	71	72	81	92
Montour County	4.53%			2.22%	1.56%		2.96%		1.05%				15.42%		1.43%	3.24%	4.03%
Perry County	0.97%			8.60%	4.30%	3.13%			9.58%	650.00%	0.88%	6.09%	11.93%		0.21%	3.09%	12.85%
Snyder County	6.33%			8.70%	2.10%		0.47%	3.48%	17.63%		1.92%		14.59%		1.87%	1.48%	2.50%
Forest County				22.39%									8.79%		0.90%	9.09%	4.79%
Cameron County				2.70%	9.09%		5.88%						17.37%		0.91%	1.64%	0.49%
Jefferson County	14.01%	0.87%	1.56%	11.88%	0.73%	2.65%		2.27%	0.90%	8.55%	0.87%	2.55%	9.40%	3.08%	0.53%	4.21%	2.65%
Total	**5.35%**	**3.23%**	**3.37%**	**4.28%**	**3.74%**	**1.56%**	**0.48%**	**2.12%**	**0.88%**	**0.44%**	**2.93%**	**3.51%**	**3.64%**	**3.24%**	**1.95%**	**1.86%**	**5.00%**

Problematic Data Points



Problematic Data Points

Perry County, at year end, had 2 employees working in NAICS 55 according to QCEW Data

periodyea	perio	area	areaname	indcod	prelir	suppres	estab	avgemp	mnth1emp	mnth2emp	mnth3emp
2021	01	000099	Perry County	55	0	0	3	3	2	2	5
2021	02	000099	Perry County	55	0	0	3	3	2	2	5
2021	03	000099	Perry County	55	0	0	3	3	2	4	2
2021	04	000099	Perry County	55	0	0	3	2	2	2	2

Problematic Data Points

severity	All	
county	Perry County	
naics_code	55	
	Column Labels	
	2022	
Row Labels	Sum of emp_count	Sum of claim_number
Predicted	24	13
1	2	1
2	2	1
3	2	1
4	2	1
5	2	1
6	2	1
7	2	1
8	2	1
9	2	1
10	2	1
11	2	1
12	2	2

Injury Rate =
 # Claims / # Employees

In Perry County, NAICS 55:

- 2 Employees
- 13 Predicted Claims

Therefore:

- Injury Rate = 13 claims / 2 Employees
- Injury Rate = **650%**

Problematic Data Points

Model Output Must be Evaluated with Business Domain Knowledge

Discussion

- Does it make sense to limit heatmap to where there are > 1,000 employees?

- What is your feedback on the data visualization for predicted values
  - Keep in mind that the fields available for predictions are:
    - NAICS Code
    - NAICS Level
    - County
    - Year / Month
    - # of Claims
    - # of Employees

A look at the next few weeks

Nov. 20	Thanksgiving - No meeting
Nov. 27	Onboarding documentation
Dec. 4	Prepare project report & presentation
Dec. 11	Pass off & presentation

Final presentation: Wednesday, Dec. 14 @ 1:40pm

Next week

- Rest - Thanksgiving!
- Merge imputation and severity assignment into repository
- Update Power BI report
- Start onboarding documentation
- Update requirements