Recordable Incidents and Near-Misses in the Workplace

Final Project, IST 718

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Project Overview:

Safety data from six companies in the oil and gas industry has been collected by their parent company for analysis. Information is captured for both *incidents* (work activities that resulted in injury) as well as *near-misses* (dangerous events that could have resulted in injury, but did not) in the parent company's safety application. This data has been extracted and scrubbed for this project with the intent to identify ways to predict and hopefully reduce injuries in the workplace.

Summary and Recommendations

The most significant finding in the data was that nearly 50% of incidents occur from employees who have been working for less than a year with the company. Through the data, we were also able to narrow down which injuries happen the most often (contusions), where they happen in the workplace (rig floor), and which companies are the worst offenders (Company D). With these findings, the most important recommendation would be to move inexperienced employees (0-1 years of employment) away from the rig floor, provide more thorough training and safety measures to new hires, and increase management during high demand times of year, especially in the summer months of June, July and August.

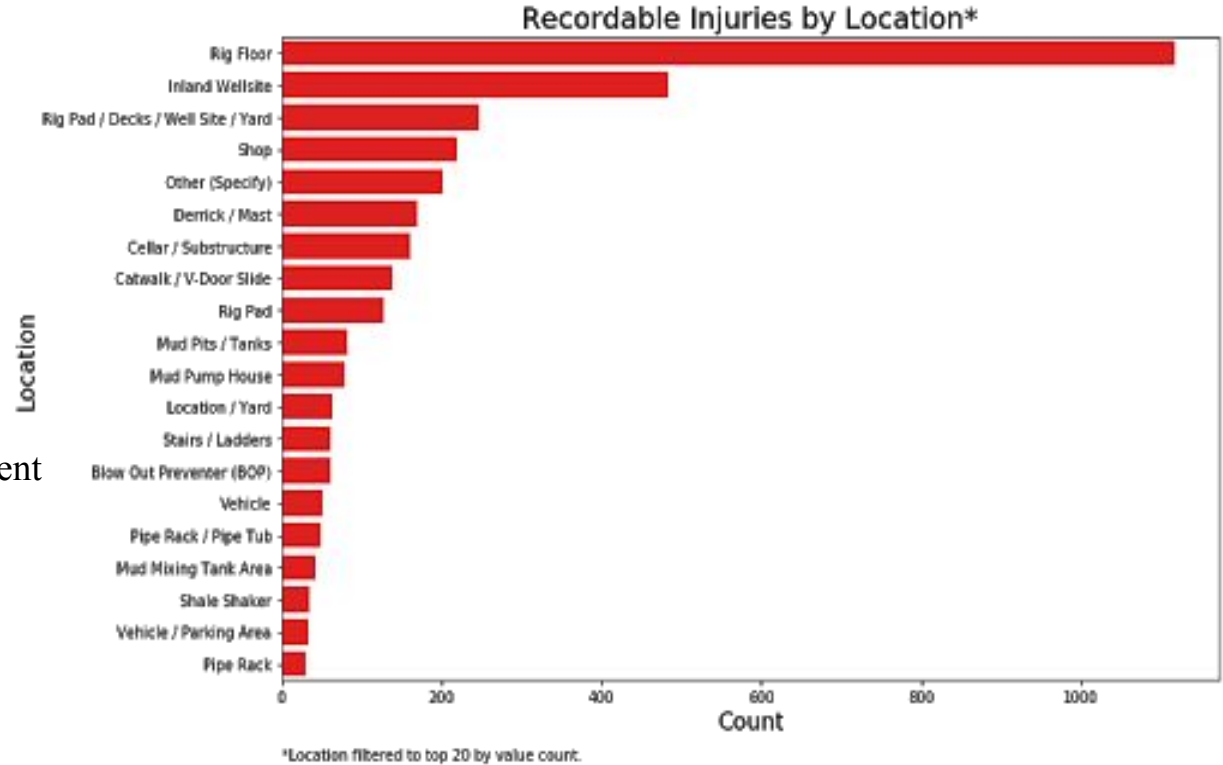Nearly 50% of injured employees have 0-1 year of experience.
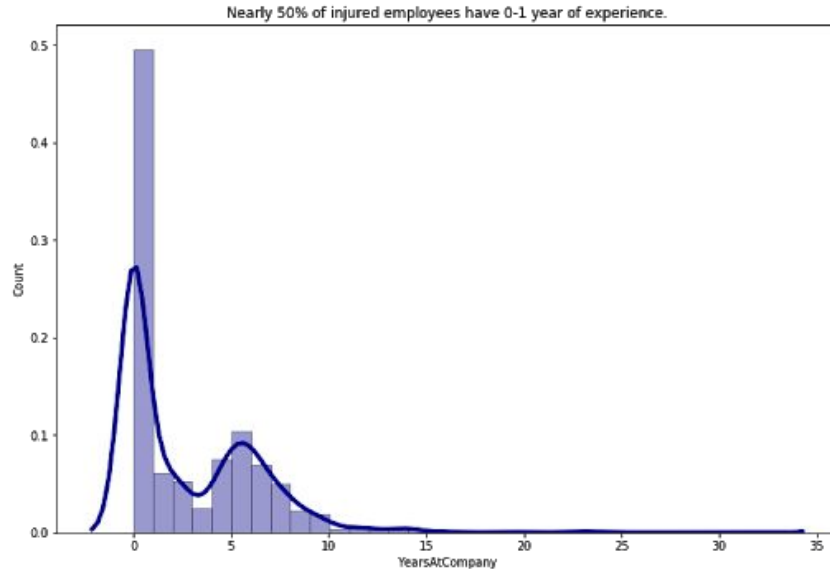
Specification

Workplace injuries are an unfortunate result of the oil & gas industry that utilizes many powerful, yet dangerous equipment. Improper use of these machines can result in injuries that can permanently maim workers and result in losses in efficiency on these rigs. Preventing injuries is vital in increasing the livelihood of our workers and improving the efficiency, and thus profits, of all the rigs operated.
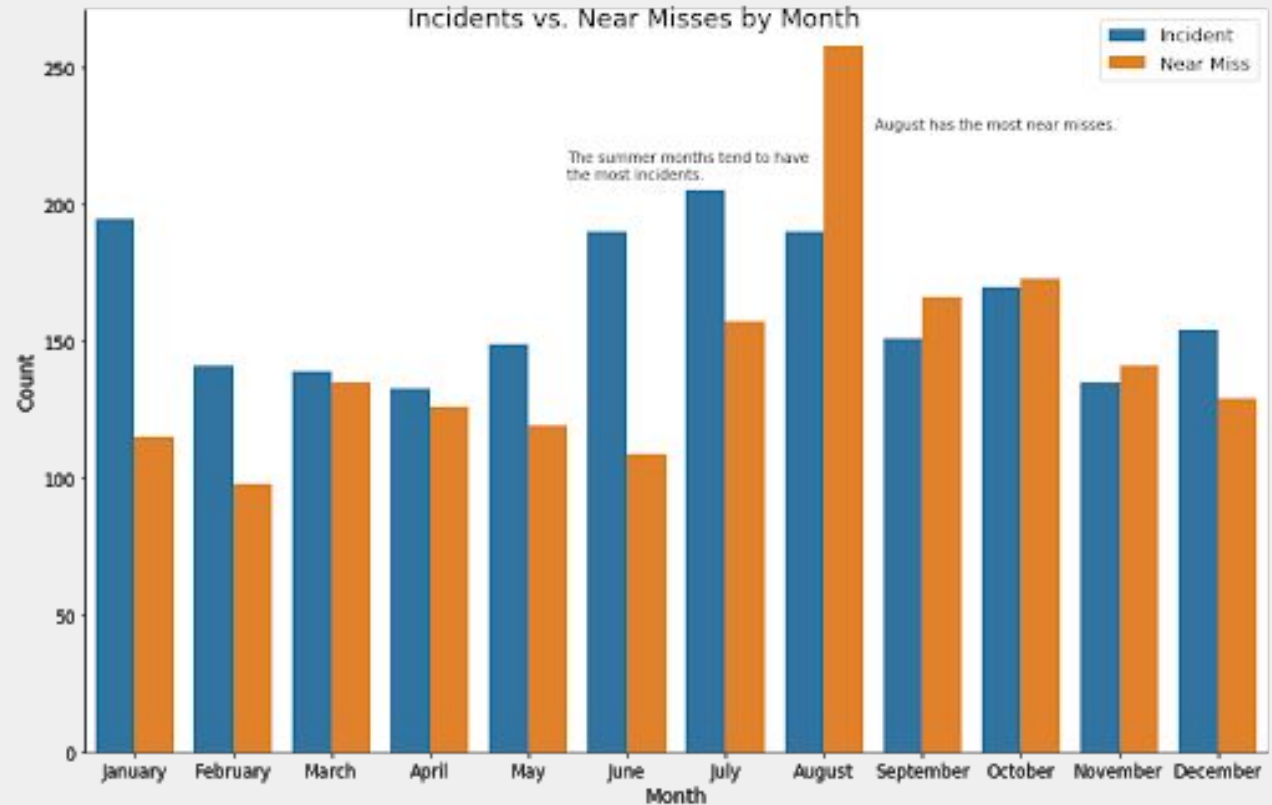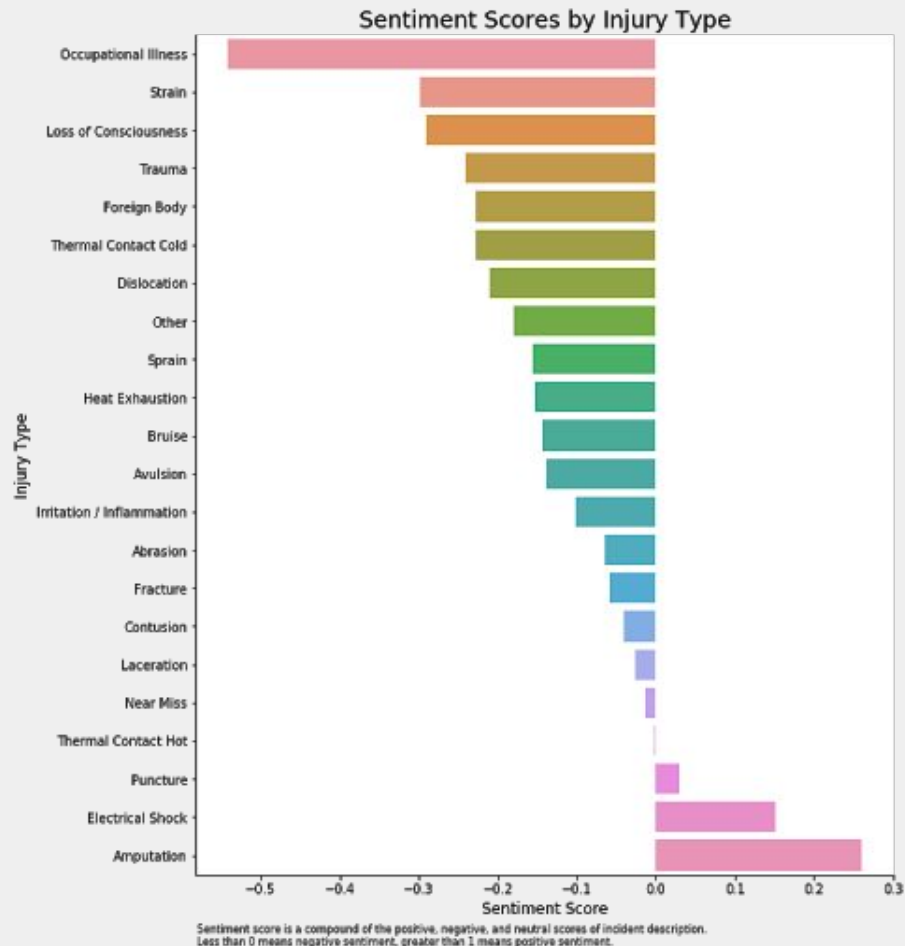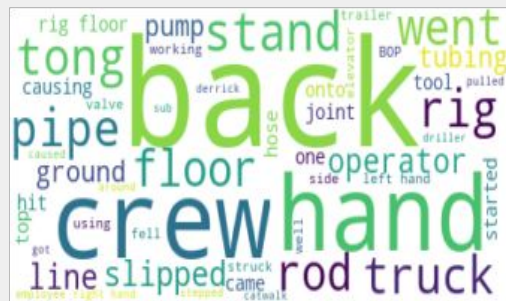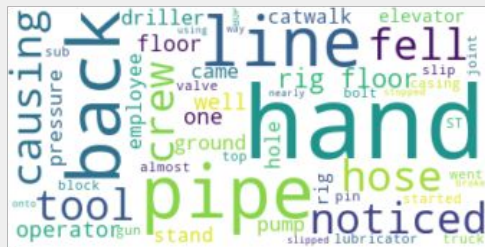
Observations

- Days of the Week
- Months
- Locations
- Type of Injury or Near-Miss
- Duration of Employment
- Company with the highest percent of Incidents or Near-Misses

Recordable Injuries by Location*

*Location filtered to top 20 by value count.

Analysis

- Text Mining

- Sentiment Analysis

- Random Forest

- Naive Bayes

Sentiment Scores by Injury Type

Sentiment score is a compound of the positive, negative, and neutral scores of incident description.
Less than 0 means negative sentiment, greater than 1 means positive sentiment.

Recommendations

- Shift inexperienced, new hires, 0-1 year, away from Rig floor
- Lessen works hour slightly early in the week, Monday - Thursday
- Review Safety Policies from Company D
- Assess Oil demands/prices/hiring cycles and how data can provide further insights

Annual Injury Count Trend by Company