

Checkpoint 3 - Interactive Visualization

INTRODUCTION

Our analyses are aimed at identifying whether 'good' police officers are rewarded by the Chicago PD. We differentiate between 'good' and 'bad' police officers with a new metric - Complaint Severity Score (CSS). The CSS is calculated for each active police officer using data from complaints filed against them by civilians. We create interactive visualizations using ObservableHQ with D3.js backend, which help us observe important relationships between key features.

CSS Metric

We calculate the CSS metric based on the past cohort's severity values using the following columns:

1. Allegation category,
2. Allegation name,
3. Whether the officer was on duty
4. Whether the complaint was filed through a citizen or through a department

We use the columns above to get a value which is then multiplied by the frequency of such allegations to get a total CSS score. Lastly, to normalize this metric, we divide it by the duration of the officer's employment in years. This ensures that officers do not have a higher CSS score only due to the fact that they were employed longer.

In short → $CSS = (\text{custom weight} * \text{allegation frequency}) / \text{employment duration in years}$.

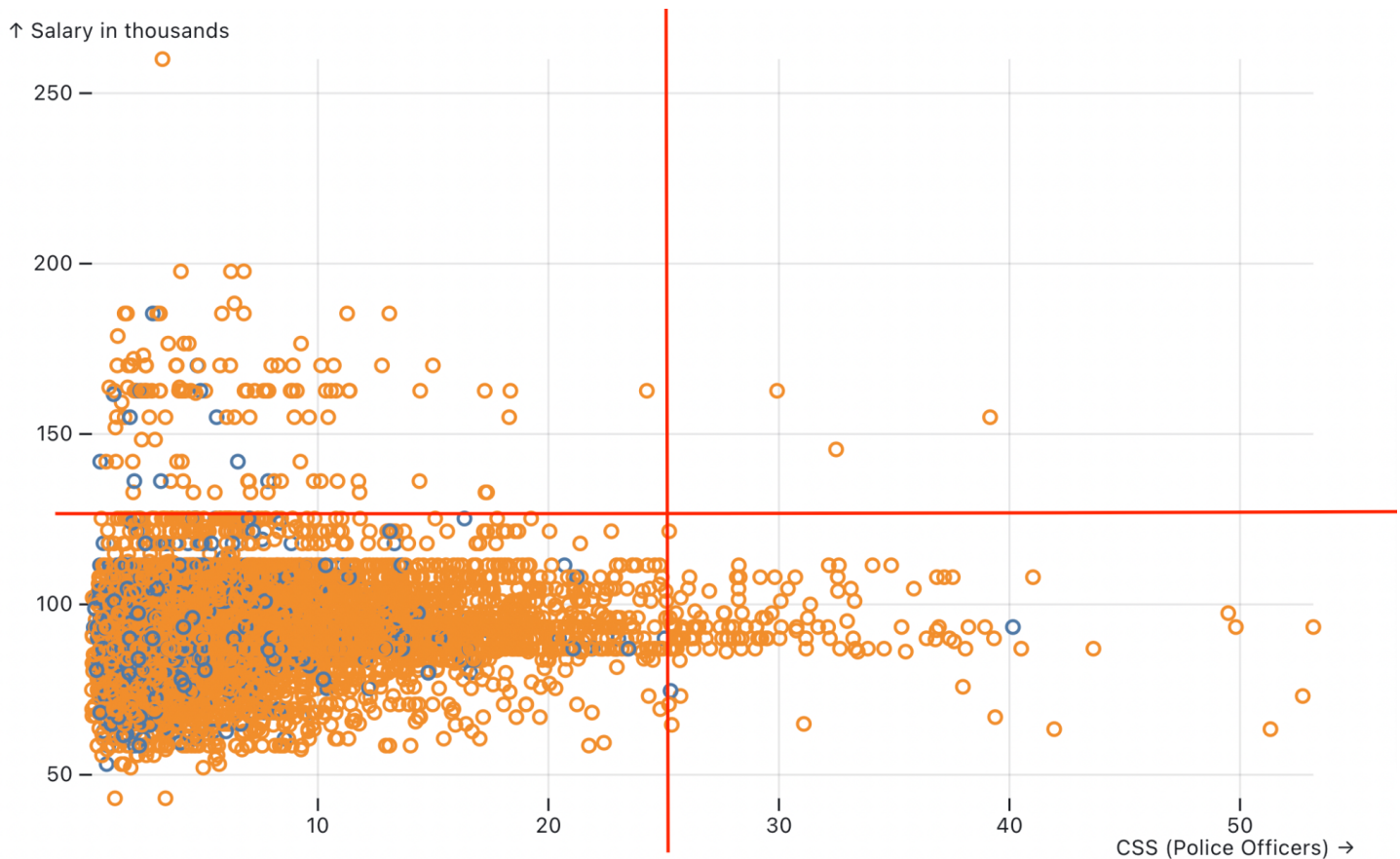
ANALYSIS

1. We will visualize the CSS of individual police officers Vs their income via an interactive scatter plot filtered by the complaint category.

Motivation: The goal of this question is to determine whether there is any inherent pattern in the relationship of CSS and an officer's salary. Could a lower salary incite an officer to act more violently or disrespectfully?

Implementation Details: The complaints against police officers can be segregated into 20 categories. We observe the relationship between the CSS of an officer and their most recent *salary*, filtered by the *complaint category*. We take the maximum salary from the data for each officer with the assumption that the maximum

salary in the record books is their current salary.



Insights:

1. Looking at the majority of complaint categories, there is a pattern of high salary for low CSS scores with some outliers, i.e. officers with high CSS scores have low salaries and vice versa (which is good). Some examples include - Illegal Search, Operation/Personnel Violations, and Use of Force. **From the example shown above from the illegal search, we divided the scatter plot into 4 quadrants and we can see in the first quadrant (top right), there are very few officers who have a high CSS score with a high income.**
2. Several complaint categories like Bribery/Official Corruption, Verbal Abuse, and Drug/Alcohol Abuse do not show any visible relationship between the CSS and salary of officers.
3. It is interesting to note that in the majority of cases, the highest earning bracket of police officers have no correlation to CSS, i.e. the highest earning members (possibly the highest ranking officers) of Chicago PD have a wide range of CSS scores. **This tells us that they receive a high salary irrespective of them being 'good'/'bad'.**

2. We would like to visualize the rewards of the police officers filtered by race and gender through an interactive bar blot.

Implementation Details: With this interactive visualization, we observe the count of rewards for each race offered to the police officers by the Chicago PD; filtered by their gender and award category.

Motivation: A clear indicator of high salary should be a low CSS score, but in the real world, bias exists which can change the outcome of rewards. With this analysis, such a bias can be highlighted.



Insights:

1. **Women are underrepresented as award winners** in the majority of award categories. Some exceptions where award-winning women police officers are comparable to that of men - Annual Bureau Award of Recognition, Attendance Recognition Award, and Complimentary Letter.
2. **White Males category of police officers have received the highest number of awards** by Chicago PD. Black and Hispanic police officers are comparable in most award categories, but their number is much less as compared to White officers. Asians, Pacific Islanders, Native Americans and Alaskan Natives account for a very low number of awards.

CONCLUSION

With these visualizations, we can see that **'good' police officers (low CSS scores) are rewarded, which holds true for several reward categories but not for all.** Perhaps, an initiative by Chicago PD to incorporate a metric like CSS while rewarding their officers for all reward categories would motivate police officers to be 'good' and they would have reduced complaints filed against them. Furthermore, we saw that the highest-paid cops are not affected by CSS. **Also, we observed a bias based on gender and race for award-winning police officers.** The Chicago PD can look into this matter and ensure that bias does not hinder a deserving or a 'good' police officer from receiving awards. Future work can look into the percentage of male/female officers as recipients of the awards to bring into limelight the skewness between genders.

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