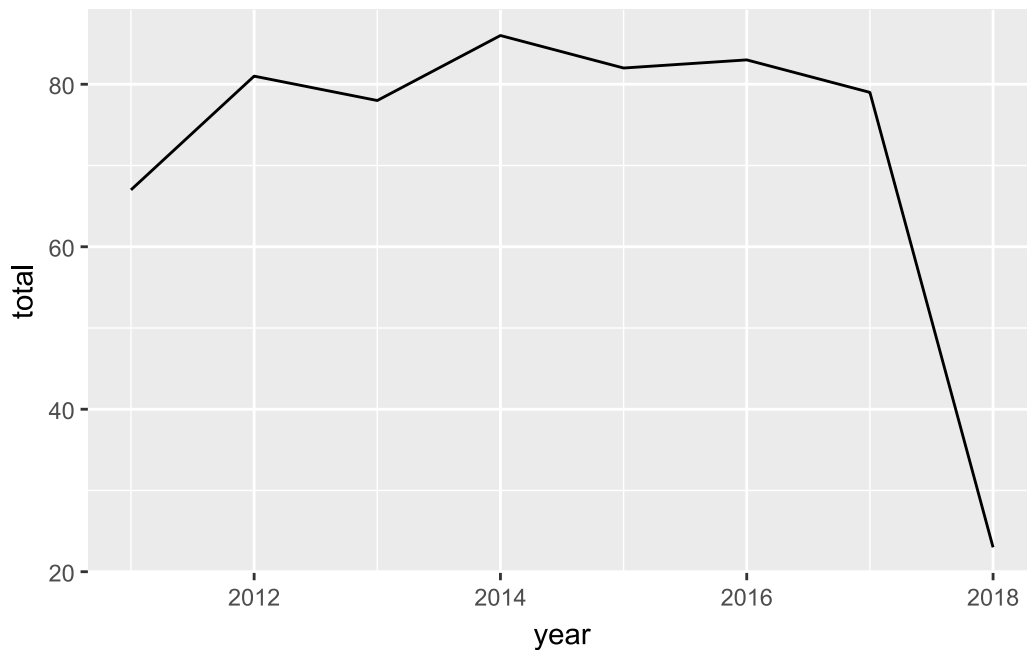# Homework 2: Health Economics

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2025-02-18

Question 1: Number of Hospitals Filing Multiple Reports

How many hospitals filed more than one report in the same year? Show your answer as a line graph of the number of hospitals over time.

Question 2: Unique Hospital IDs

After removing/combining multiple reports, how many unique hospital IDs (Medicare provider numbers) exist in the data?

```
# how many unique hospital ids exist after combining provider numbers
unique_provider_nos <- hcris_Data %>%
group_by(provider_number) %>%
count(provider_number) %>%
summarize(total = n())
```
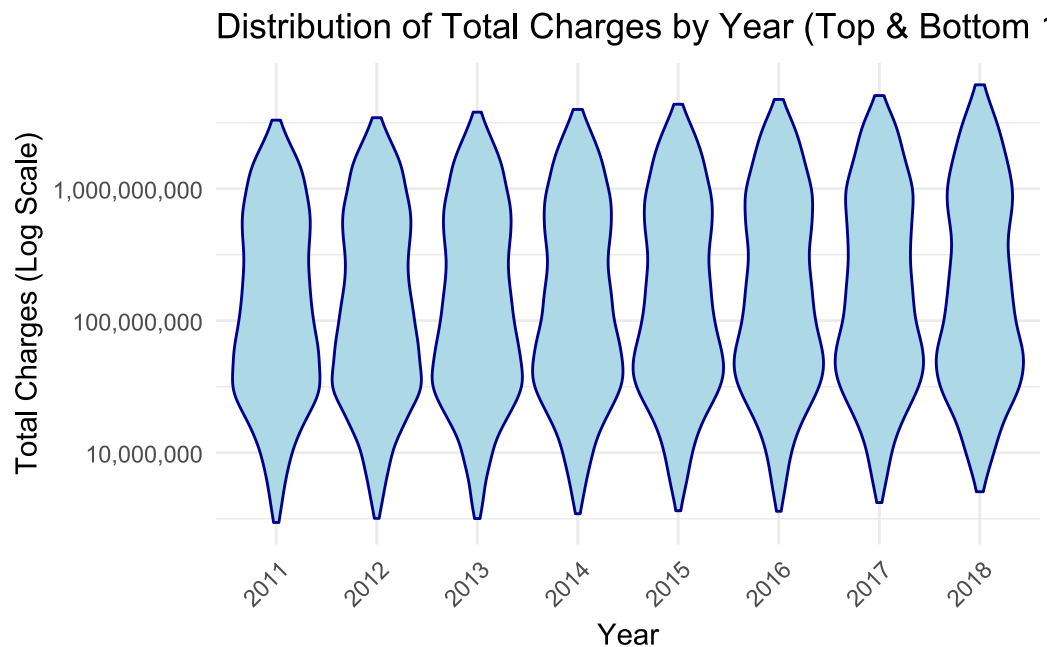
```
# total - 9,323

tibble(unique_hospital_ids = nrow(unique_provider_nos))
```

```
# A tibble: 1 × 1
  unique_hospital_ids
                <int>
1                9323
```
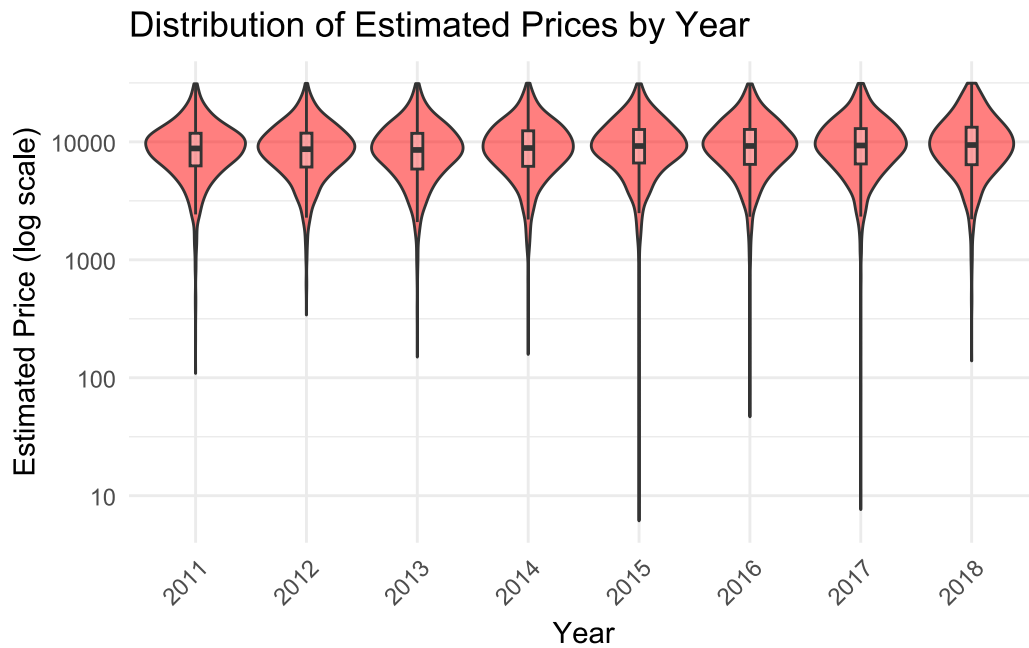
Question 3: Distribution of Total Charges by Year

What is the distribution of total charges in each year? Show your results with a violin plot.

Question 4: Distribution of Estimated Prices by Year

What is the distribution of estimated prices in each year? Show your results with a violin plot.

Distribution of Estimated Prices by Year

Question 5: Average Price for Penalized vs. Non-Penalized Hospitals

Calculate the average price among penalized versus non-penalized hospitals.

penalty	avg_price
Non-Penalized	9791.404
Penalized	10234.975

Question 6 Split hospitals into quartiles based on bed size.

Provide a table of the average price among treated/control groups for each quartile.

Bed Quartile	Avg Price (Non-Penalized)	Avg Price (Penalized)
1	9617.651	10648.84

Question 7 Find the average treatment effect using each of the following estimators, and present your results in a single table:

Nearest neighbor matching (1-to-1) with inverse variance distance based on quartiles of bed size

Nearest neighbor matching (1-to-1) with Mahalanobis distance based on quartiles of bed size

Inverse propensity weighting, where the propensity scores are based on quartiles of bed size

Simple linear regression, adjusting for quartiles of bed size using dummy variables and appropriate interactions as discussed in class