

Homework 4

ECON 470, Spring 2025

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Here is a link to my repository: {https://github.com/mollyjc02/Homework_4.git}

1. Remove all SNPs, 800-series plans, and prescription drug only plans (i.e., plans that do not offer Part C benefits). Provide a box and whisker plot showing the distribution of plan counts by county over time. Do you think that the number of plans is sufficient, too few, or too many?

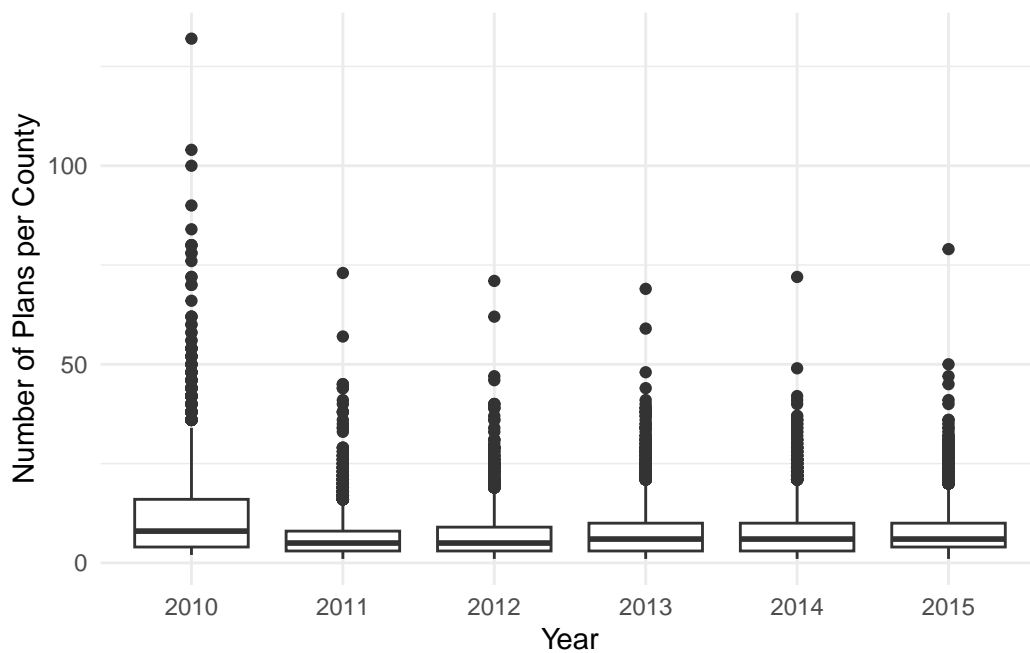


Figure 1: Distribution of Plan Counts by County Over Time

2. Provide bar graphs showing the distribution of star ratings in 2010, 2012, and 2015. How has this distribution changed over time?

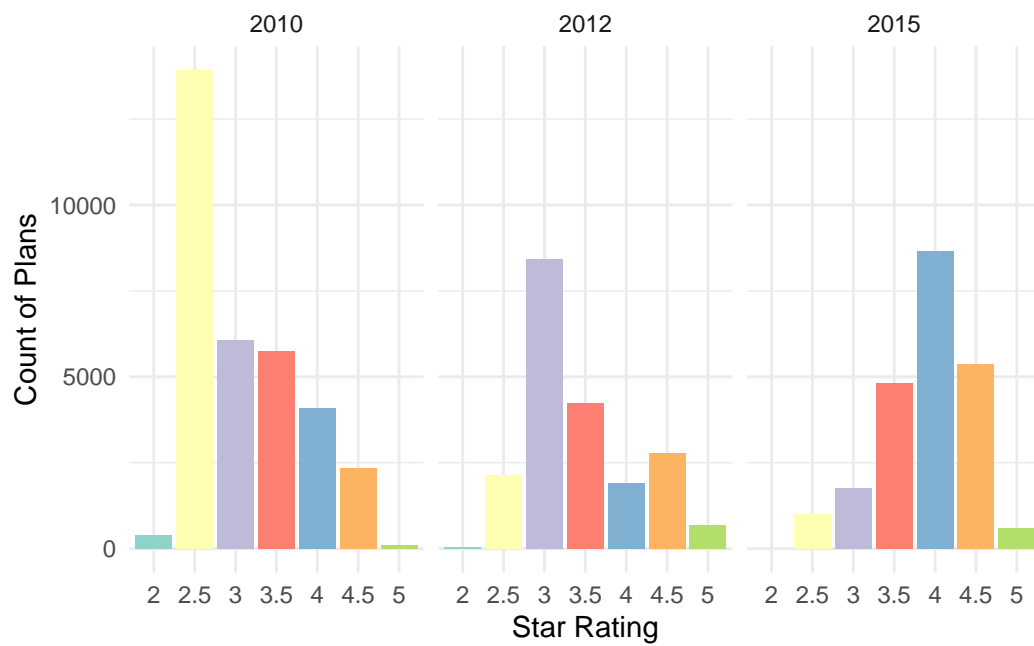


Figure 2: Distribution of Star Ratings by Year

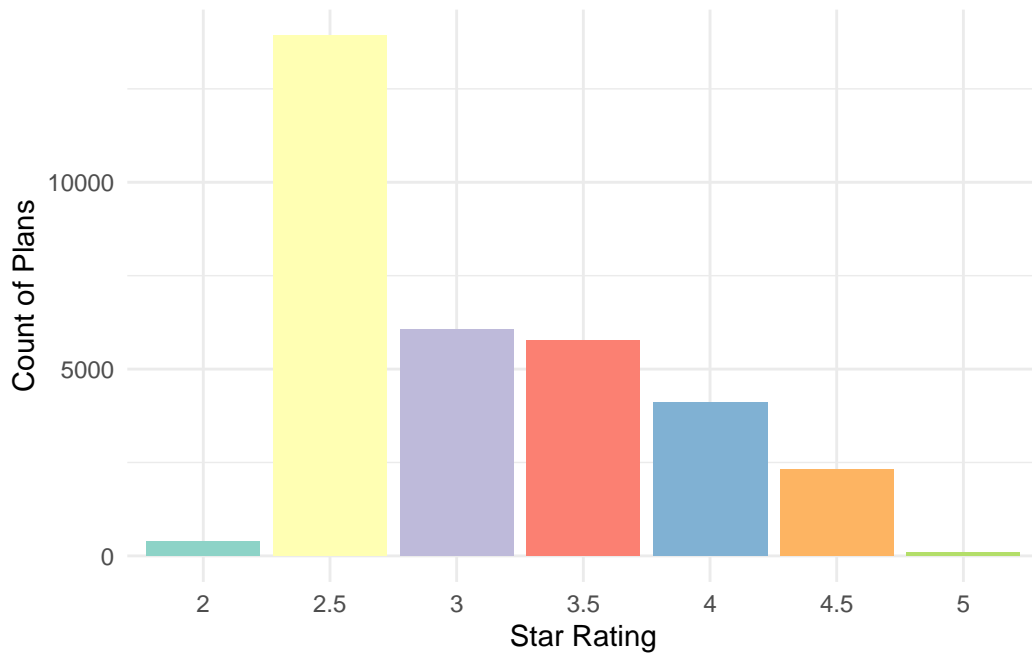


Figure 3: Distribution of Star Ratings in 2010

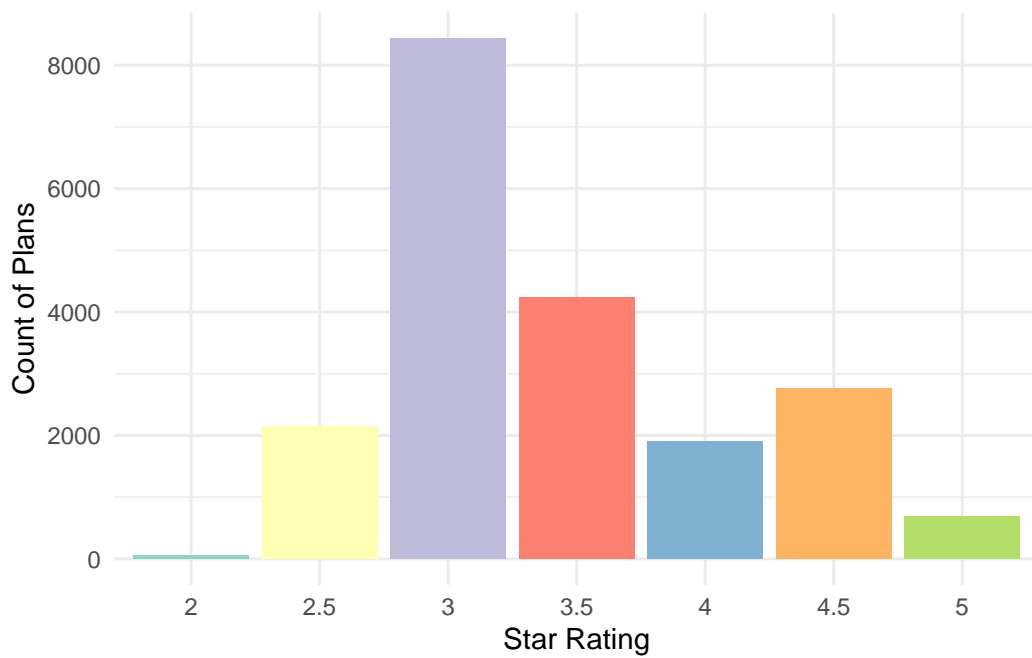


Figure 4: Distribution of Star Ratings in 2012

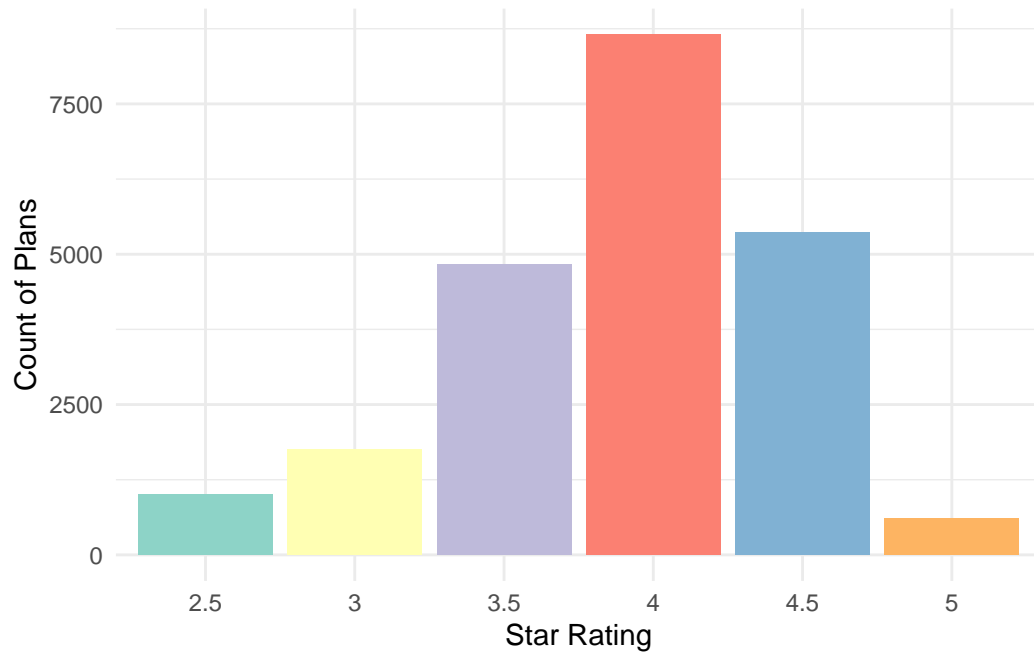


Figure 5: Distribution of Star Ratings in 2015

3. Plot the average benchmark payment over time from 2010 through 2015. How much has the average benchmark payment risen over the years?

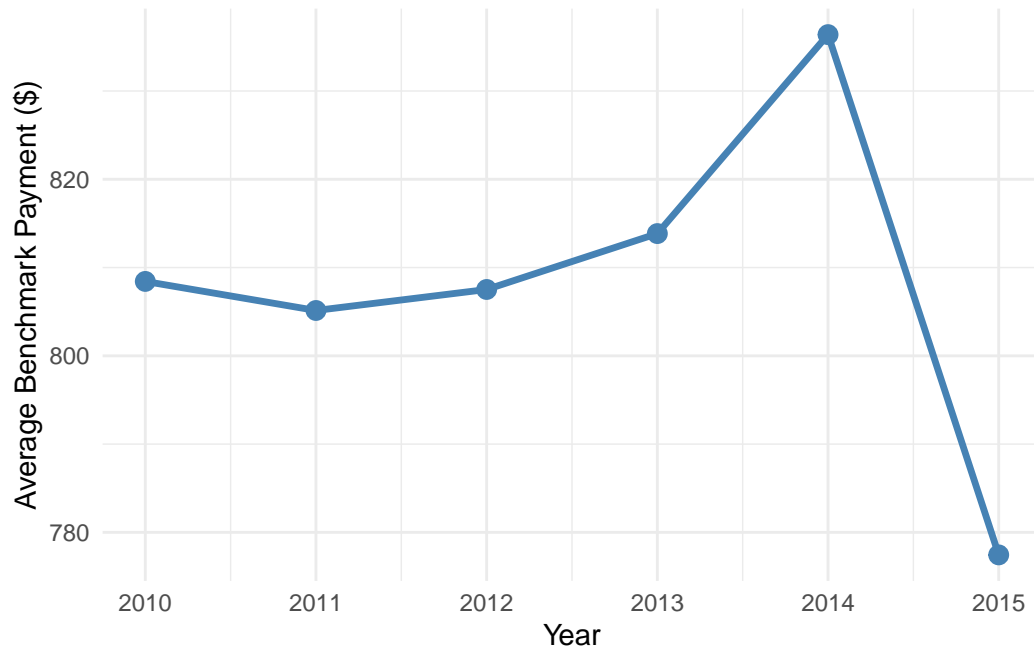


Figure 6: Average Benchmark Payment for MA Plans (2010–2015)

4. Plot the average share of Medicare Advantage (relative to all Medicare eligibles) over time from 2010 through 2015. Has Medicare Advantage increased or decreased in popularity? How does this share correlate with benchmark payments?

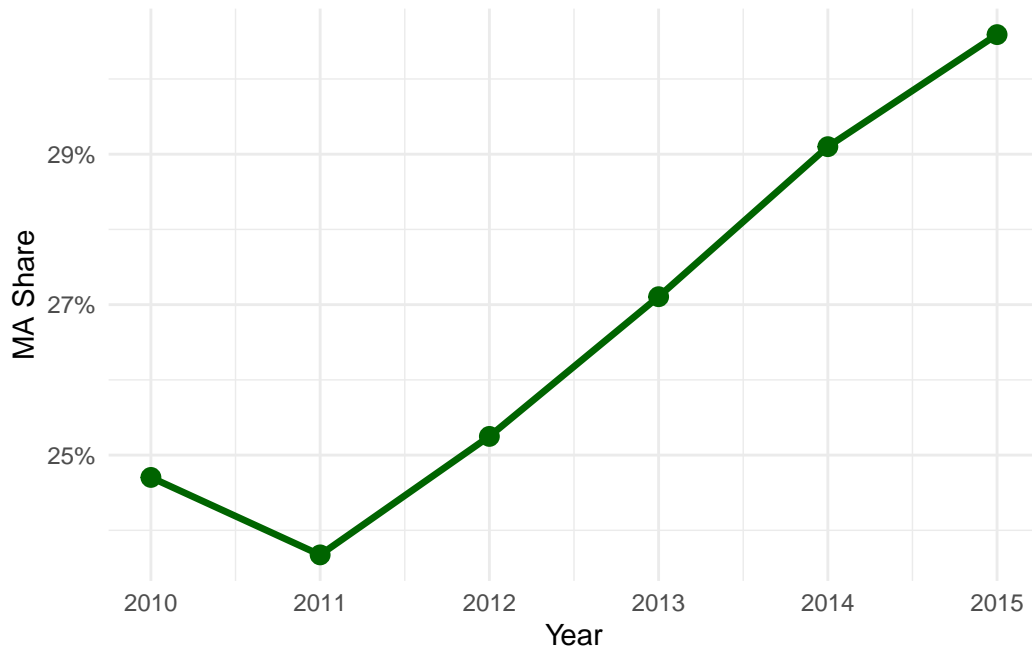


Figure 7: Average Medicare Advantage Share of Medicare Eligibles (2010–2015)

The following questions are utilizing data from 2010 only.

5. Calculate the running variable underlying the star rating. Provide a table showing the number of plans that are rounded up into a 3-star, 3.5-star, 4-star, 4.5-star, and 5-star rating.

Rounded Rating	Number of Plans
3.0	6280
3.5	6694
4.0	5222
4.5	106
5.0	52

Figure 8: Number of Plans by Rounded Star Rating

6. Using the RD estimator with a bandwidth of 0.125, provide an estimate of the effect of receiving a 3-star versus a 2.5 star rating on enrollments. Repeat the exercise to estimate the effects at 3.5 stars, and summarize your results in a table.

```
$Estimate
      tau.us  tau.bc  se.us  se.rb
[1,] 433.338 758.9467 84.67799 246.8523

$bws
      left right
h 0.125 0.125
b 0.125 0.125
```

\$z

	z
Conventional	5.117481
Bias-Corrected	8.962739
Robust	3.074497

\$pv

	P> z
Conventional	3.096434e-07
Bias-Corrected	3.167130e-19
Robust	2.108580e-03

\$ci

	CI Lower	CI Upper
Conventional	267.3722	599.3038
Bias-Corrected	592.9809	924.9125
Robust	275.1250	1242.7684

\$beta_Y_p_l

[1] 138.9486 117.1404

\$beta_Y_p_r

[1] 572.2867 609.5856

\$V_cl_l

	[,1]	[,2]
[1,]	178.132	2113.671
[2,]	2113.671	47847.663

\$V_cl_r

	[,1]	[,2]
[1,]	6992.231	-94480.48
[2,]	-94480.482	1710991.59

\$V_rb_l

	[,1]	[,2]
[1,]	50256.74	1756901
[2,]	1756900.59	61536247

\$V_rb_r

	[,1]	[,2]
[1,]	10679.34	-313515.4


```
[2,] -313515.42 13759861.1
```

```
$N
```

```
[1] 13924 6068
```

```
$N_h
```

```
[1] 7912 1004
```

```
$N_b
```

```
[1] 7912 1004
```

```
$M
```

```
[1] 13924 6068
```

```
$tau_cl
```

```
[1] 138.9486 572.2867
```

```
$tau_bc
```

```
[1] -42.94713 715.99959
```

```
$c
```

```
[1] 0
```

```
$p
```

```
[1] 1
```

```
$q
```

```
[1] 2
```

```
$bias
```

```
[1] 181.8958 -143.7129
```

```
$kernel
```

```
[1] "Triangular"
```

```
$all
```

```
NULL
```

```
$vce
```

```
[1] "NN"
```

```
$bwselect
```

```
[1] "Manual"
```

```
$level
[1] 95

$masspoints
[1] "adjust"

$rdmodel
[1] "Sharp RD estimates using local polynomial regression."

$beta_covs
NULL

$call
rdrobust(y = ma.rd1$avg_enrollment, x = ma.rd1$score, c = 0,
        h = 0.125)

attr("class")
[1] "rdrobust"
```