

# Change in Equality of Surgical Fee Schedule in Japan

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Yoshinori Nakata MD MBA

Professor

Teikyo University Graduate School of Public Health

[yinakata@med.teikyo-u.ac.jp](mailto:yinakata@med.teikyo-u.ac.jp)

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# Context

- The surgical fee schedule failed to reflect resource utilization and is unequal among surgical specialties by comparing the efficiency scores calculated from data envelopment analysis (DEA)[1-3].
- DEA is a measure of efficiency that takes account of multiple inputs and multiple outputs.
- The Gini coefficient is a well-known index for measuring the degree of inequality.
- Purpose: to examine how the degree of inequality of surgical fee schedule changed.

# Methods

- Data: the surgical procedures performed in Teikyo University Hospital in 2013-18.
- The decision making unit: a surgeon with the highest academic rank in the surgery.
- Inputs were defined as (1) the number of medical doctors who assisted surgery, and (2) the time of operation from skin incision to closure. An output was defined as the surgical fee.
- Each surgeon's efficiency score using output-oriented Charnes-Cooper-Rhodes (CCR) model of DEA was calculated, and the median of efficiency scores in each surgical specialty was computed.

# Methods

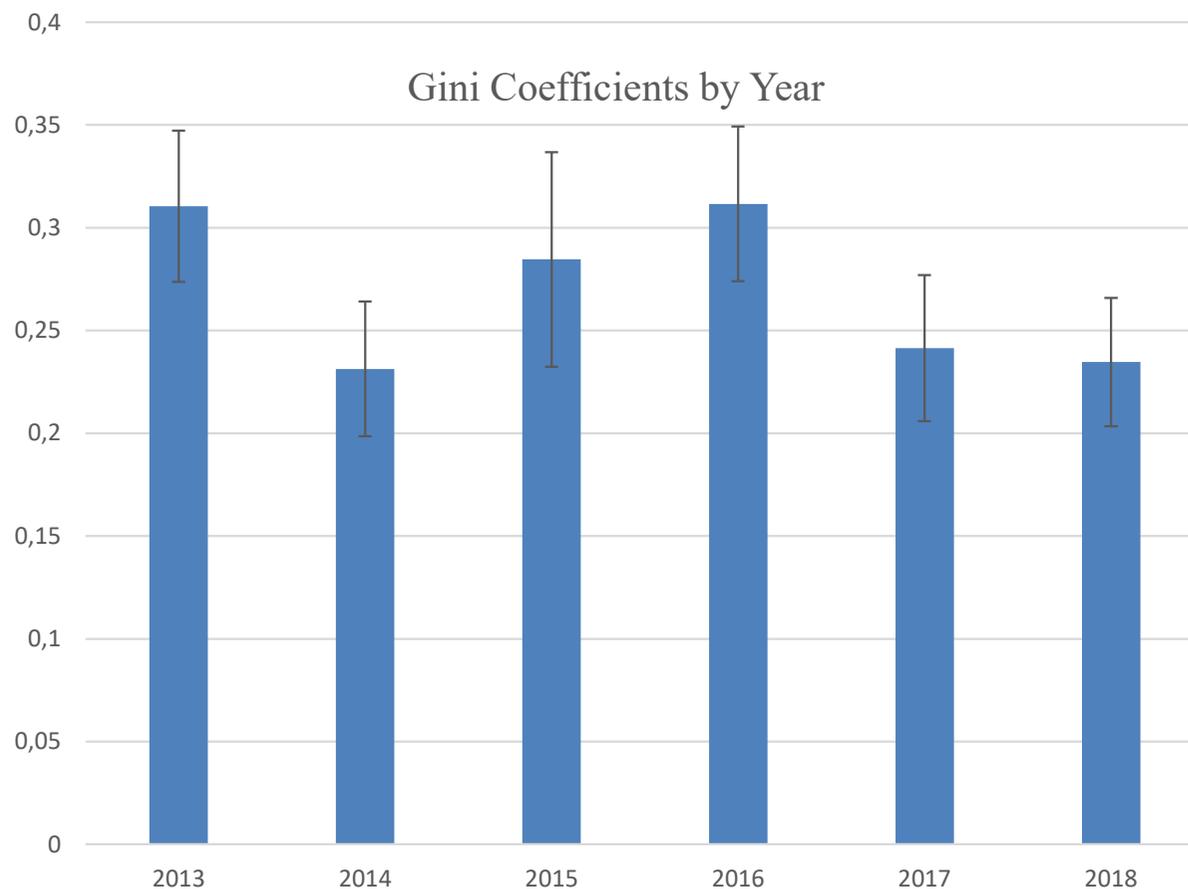
- The authors inferred Gini coefficients and their standard errors in each year and each surgical fee schedule using the medians of efficiency scores.
- The Gini coefficients were compared between the years and between the surgical fee schedules using the methods described by Davidson [4].
- A p-value  $< 0.05$  was considered statistically significant.

# Results

- We analyzed 16,307 surgical procedures during the study period of 2013-18. The numbers of surgeons and surgical procedures were stable over the study periods.
- Figure 1 showed the change in Gini coefficients by year. The Gini coefficients ranged from 0.231 to 0.312. There was no statistically significant difference between the years ( $p > 0.05$ ).



# FIGURE 1



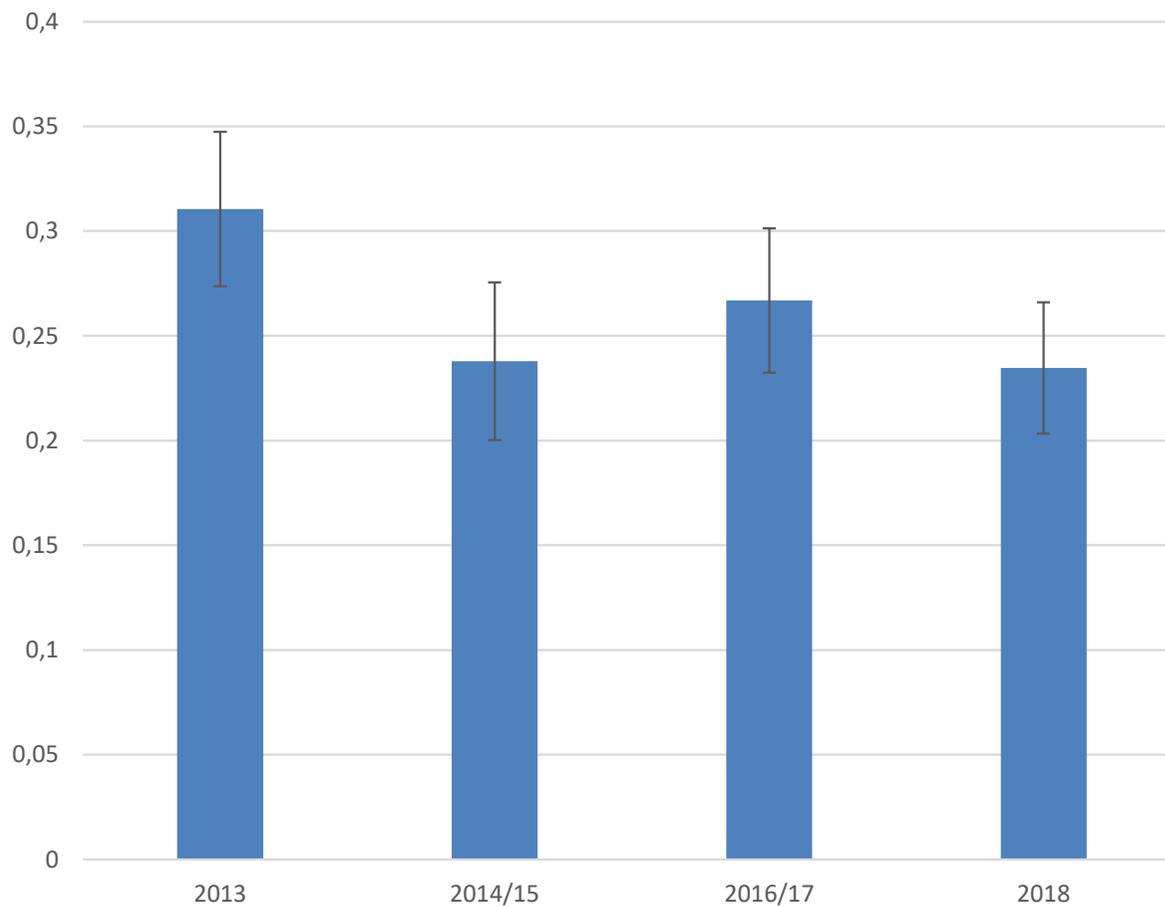
# Results

- Figure 2 showed the change in Gini coefficients by surgical fee schedule. The Gini coefficients ranged from 0.235 to 0.310. There was no statistically significant difference between the surgical fee schedules ( $p > 0.05$ ).



# FIGURE 2

Gini Coefficients by Fee Schedule



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# Discussion

- The degree of inequality did not significantly change during the study periods of 2013-2018 despite three revisions of surgical fee schedules.
- The Gini coefficients ranged from 0.23 to 0.32.
- There is no known threshold for acceptable inequality of efficiency scores.
- This is the first study that demonstrated that the degree of inequality of surgical fee schedules remained constant from 2013 through 2018.

# References

1. Nakata Y, et al. *Int J Health Serv* 2015; 45: 801-809.
2. Nakata Y, et al. *Int J Health Care Qual Assur* 2015; 28: 635-643.
3. Nakata Y, et al. *Int J Health Care Qual Assur* 2019; 32: 1013-1021.
4. Davidson R. [\*J Econom\*](#) 2009; 150:30-40