Assessment of Nonresearch Industry Payments to Otolaryngologists in 2014 and 2015

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Sponsorships or competing interests that may be relevant to content are disclosed at the end of this article.

Abstract

Objective. To characterize, describe, and compare nonresearch industry payments made to otolaryngologists in 2014 and 2015. Additionally, to describe industry payment variation within otolaryngology and among other surgical specialties.

Study Design. Retrospective cross-sectional database analysis.

Setting. Open Payments Database.

Subjects and Methods. Nonresearch payments made to US otolaryngologists were characterized and compared by payment amount, nature of payment, sponsor, and census region between 2014 and 2015. Payments in otolaryngology were compared with those in other surgical specialties.

Results. From 2014 to 2015, there was an increase in the number of compensated otolaryngologists (7903 vs 7946) and in the mean payment per compensated otolaryngologist ($1096 vs $1242), as well as a decrease in the median payment per compensated otolaryngologist ($169 vs $165, $P = .274$). Approximately 90% of total payments made in both years were attributed to food and beverage. Northeast census region otolaryngologists received the highest median payment in 2014 and 2015. Compared with other surgical specialists, otolaryngologists received the lowest mean payment in 2014 and 2015 and the second-lowest and lowest median payment in 2014 and 2015, respectively.

Conclusion. The increase in the mean payment and number of compensated otolaryngologists can be explained by normal annual variation, stronger industry-otolaryngologist relationships, or improved reporting; additional years of data and improved public awareness of the Sunshine Act will facilitate determining long-term trends. The large change in disparity between the mean and median from 2014 to 2015 suggests greater payment variation. Otolaryngologists continue to demonstrate limited industry ties when compared with other surgical specialists.

Keywords

Sunshine Act, Open Payments Database, nonresearch industry payments, Centers for Medicare and Medicaid Services

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the total number of compensated otolaryngologists, as well as the number and monetary value of nonresearch payments made to otolaryngologists, decreased from 2014 to 2015. In addition, we aim to make comparisons between payments in otolaryngology and those in other surgical specialties, with the hypothesis that otolaryngology continues to have limited industry ties as compared with other surgical specialties.

**Methods**

**Data Source**

The Physician Payments Sunshine Act requires manufacturers to submit data to the Centers for Medicare and Medicaid Services (CMS) regarding transfers of value >$10 made to providers. CMS has made these data publicly available online in the Open Payments Database, which qualifies as nonhuman subject research; therefore, institutional review board approval was not required.

**Data Acquisition and Coding**

All nonresearch industry payment data were downloaded from the General Payments 2014 and 2015 data sets in the CMS Open Payments Database. The 2014 data represented all nonresearch payments made to providers between January 1, 2014, and December 31, 2014, and the 2015 data, between January 1, 2015, and December 31, 2015. We excluded research payments from our study, as companies can delay publication of research payments associated with drugs and devices in development or new applications of existing products. Payments made directly to hospitals or those associated with non-US physicians and nonallopathic/osteopathic physicians were also excluded from this study. Physicians were categorized by specialty via a search for each surgical specialty and subspecialty in the Open Payments Data Explorer.

**Analyses**

Using the 2014 General Payments data set, we first calculated the total number of US licensed otolaryngologists receiving nonresearch industry payment in 2014. The sum of all payments made to otolaryngologists in this year was calculated, as well as the mean, standard deviation, median, and interquartile range (IQR) of payments per compensated otolaryngologist. Next, using the AAMC Physician Specialty Data Report, we determined the total number of otolaryngologists in the United States; this enabled us to calculate the mean payment per active otolaryngologist (per capita) and the proportion of compensated otolaryngologists for this year.

Each payment in the database is characterized by nature of payment (eg, food/beverage, education). We determined the number of payments, sum of payments, and mean and median payment value attributed to each category in 2014. Next, we characterized the sponsors making nonresearch payments to otolaryngologists in this year. We determined the total nonresearch payment associated with each sponsor and subsequently categorized the top 10 highest-paying sponsors as manufacturers of pharmaceuticals, medical devices, or both through information on product websites. Finally, we characterized nonresearch payments made to otolaryngologists in 2014 by US Census region. For each US Census region (Midwest, Northeast, South, West), the following was calculated: total payment made to otolaryngologists, number of otolaryngologists receiving payment, and mean and median payment per compensated otolaryngologist. All of the analyses were then repeated with the 2015 General Payments data set in the Open Payments Database, and each result from 2014 was compared with its equivalent in 2015.

We compared nonresearch payments made to otolaryngologists with those made to surgeons in other specialties. The total number of compensated surgeons, mean and median payment per compensated surgeon, standard deviation, and IQR were determined for the following surgical specialties by year: general surgery, neurosurgery, ophthalmology, orthopedic surgery, plastic surgery, thoracic surgery, urology, and vascular surgery.

All statistical analyses were performed with Stata 13.0 (StataCorp, College Station, Texas) and Microsoft Excel. We learned that our 2014 and 2015 data represented highly skewed distributions per the Shapiro-Wilk test \( (P < .001) \) and graphing histograms and Q-Q plots. For this reason, the Mann-Whitney \( U \) test was used to assess differences in median payments between 2014 and 2015 data, with an \( \alpha \) level of 0.05 considered statistically significant. We also conducted comparisons between 2014 and 2015 mean data with 1-way analysis of variance (see appendix in the online version of the article).

**Results**

**Nonresearch Industry Payments to Otolaryngologists per Year**

After our exclusion criteria were applied, a total of 66,213 transfers of value worth $8,663,021 were found to be paid to 7,903 otolaryngologists for nonresearch purposes in 2014. In 2015, 64,267 transfers worth $9,869,393 were made to 7,946 otolaryngologists. Approximately 85% and 84% of all otolaryngologists were compensated with nonresearch industry payments in 2014 and 2015, respectively, and the mean payment per capita (US otolaryngologist) increased from $930 in 2014 to $1049 in 2015.

The discrepancy between the mean and median payment amount per compensated otolaryngologist increased from being 6-fold in 2014 (mean, $1096; median, $169) to nearly 8-fold in 2015 (mean, $1242; median, $165). The decrease in median payment per compensated otolaryngologist was not statistically significant \( (P = .274) \) nor financially meaningful.

In both years, the compensation of top earners in otolaryngology represented a disproportionately large fraction of total payment. In 2014, the top 10% of earners accounted for 81% ($7,041,539) of the overall value, and approximately half of this value (43%, $3,697,580) was
among these 10 sponsors; the total value of payments made to otolaryngologists in 2014 ($7,773,068) was attributed to the top 1% of earners.

**Nonresearch Industry Payments to Otolaryngologists Characterized by Nature of Payment per Year**

In 2014 and 2015, the largest proportion of nonresearch payments was classified as “food and beverage” (89% and 88%, respectively). Significant increases in median payment value from 2014 to 2015 were observed in the following categories: compensation for services other than consulting (including serving as faculty or as a speaker at a venue other than a continuing education program; \( P < .001 \)), education \( (P < .001) \), entertainment \( (P = .023) \), food/beverage \( (P < .001) \), and honoraria \( (P < .001) \) (Table 1). Payments related to consulting fees saw a significant decrease in the median \( (P < .001) \). Of all the categories, each saw an increase in the median from 2014 to 2015, with the exception of grants and consulting fees. Additionally, each saw an increase in the mean, with the exception of grants.

**Nonresearch Industry Payments to Otolaryngologists Characterized by Sponsor per Year**

A total of 345 companies made nonresearch payments to otolaryngologists in 2014, whereas 351 companies made payments in 2015. The top 20 highest-paying sponsors accounted for 82% of all nonresearch payment ($7,090,520) to otolaryngologists in 2014, while the top 10 and top 5 highest-paying sponsors accounted for 65% ($5,671,254) and 42% ($3,650,928), respectively. In 2015, the top 20 highest-paying sponsors accounted for 79% of all non-research payment ($7,773,068) to otolaryngologists, with the top 10 and top 5 highest-paying sponsors accounting for 64% ($6,322,837) and 44% ($4,325,919), respectively. In 2014, among the top 10 highest-paying sponsors, 6 were medical device companies; 3 were pharmaceutical companies; and 1 manufactured both pharmaceuticals and medical devices. In 2015, 5 medical device companies, 4 pharmaceutical companies, and 1 dual manufacturer represented the top 10 highest-paying sponsors.

Among the top 10 highest-paying sponsors in 2014, 4 made fewer nonresearch payments to otolaryngologists as compared with 2015, whereas 6 made greater payments. There were year-to-year variations in payment amounts among these 10 sponsors; the total value of payments made to otolaryngologists increased in 2015 for 4 sponsors, while it decreased for 6 others (specific sponsor data not shown).

**Nonresearch Industry Payments to Otolaryngologists Characterized by Region per Year**

Among the 4 US Census regions in 2014, the median payment per compensated otolaryngologist was lowest in the West region in 2014 ($149) and 2015 ($152). The Northeast region saw the highest median payment per compensated otolaryngologist in 2014 ($179) and 2015 ($175). The median payment changes in each region from 2014 to 2015 were not statistically significant. Additionally, the West region received the highest mean payment per compensated otolaryngologist in 2014 ($1243) and 2015 ($1351). Mean and median payment values are represented in Figure 1, and the total number and sum of payments per census region are listed in Table 2. Of note, 52 and 63 compensated otolaryngologists in 2014 and 2015, respectively, were from a US territory; these physicians were not included in the census region analyses.

**Comparison with Other Surgical Specialties**

In 2014, 93,280 surgeons were identified as receiving $700,492,658 from drug and device manufacturers. Among compensated surgeons, the distribution of total payment amounts received by individual surgeons was skewed, with the top 10% of earners accounting for 93% ($653,113,602) of the overall value. The mean payment amount per compensated surgeon ($7703) was approximately 31-fold greater than the median ($252). The discrepancy between the mean and median payment value for each surgical specialty is depicted in Figure 2.

Among surgeons, otolaryngologists received the lowest mean payment in 2014 ($1096) and 2015 ($1242), as well as the second-lowest median payment and lowest median payment in 2014 ($169) and 2015 ($165), respectively. Compared with the surgical specialty with the highest mean payment (orthopedic surgery), otolaryngology exhibited approximately a 17-fold difference in mean payment per compensated physician in 2014 ($18,432 vs $1096) and a 15-fold difference in 2015 ($18,688 vs $1242). The mean payment per compensated physician of the nearest surgical specialty in terms of payment (general surgery) was more than double that of otolaryngology in 2014 ($2381 vs $1096) and approximately double that of otolaryngology in 2015 ($2113 vs $1242). Compared with the surgical specialty with the highest median payment (thoracic surgery), otolaryngology exhibited an approximately 4-fold difference in median payment per compensated physician in 2014 ($626 vs $169) and 2015 ($696 vs $165).

The IQR for payments per compensated surgeon was smallest in the field of otolaryngology in 2014 ($346) and 2015 ($377). In 2014, there was an approximately 7-fold difference in the IQR per compensated otolaryngologist versus the specialty with the largest IQR (thoracic surgery, $2433) and a minimal difference versus the nearest specialty in terms of IQR (ophthalmology, $451). In 2015, there was an approximately 7-fold difference in the IQR per compensated otolaryngologist versus the specialty with the
largest IQR (thoracic surgery, $2509) and a minimal difference versus the nearest specialty in terms of IQR (ophthalmology, $445). The total number of surgeons receiving payment and the mean and median payment per compensated surgeon for each surgical specialty are listed in Table 3.

Discussion

This is the first study to characterize and compare nonresearch payments made to US otolaryngologists from the 2014 and 2015 data releases of the Open Payments Database. Our group and Cvetanovich et al previously characterized nonresearch payments made to otolaryngologists using the initial data release of the Sunshine Act, which represented the latter 5 months of 2013.20,21 We did not make comparisons to these initial release studies, because they represented payments over 5 months. Additional studies in otolaryngology characterized research payments made to otolaryngologists in 2015,22 the association between industry support and scholarly impact among academic otolaryngologists in 2014,27 and sex disparities among industry-academic otolaryngologist relationships in 2014.28

In plastic surgery, Gangopadhyay and Chao found a significant decrease in the number of physicians holding industry relationships as well as a reduction in the sum of payments soon after the implementation of the Open Payments Database,29 perhaps explained by a decrease in enthusiasm to hold financial relationships, given the growing public scrutiny of such ties under the Sunshine Act. However, awareness of the Sunshine Act is difficult to quantify. One recent survey found that only 12% of respondents knew that such payment details were available publicly and 5% knew if their own physicians had received payments.30 As it is possible that awareness remains low, we did not attempt to determine the impact of awareness of the Sunshine Act on physician and industry behavior.

In our study, we sought to characterize nonresearch payments made to otolaryngologists and assess for changes between 2014 and 2015, and we found that 2015 had a greater discrepancy between the majority and the highest-paid otolaryngologists. The increased IQR of payment ($346-$377) and ratio of mean:median from 2014 to 2015 corroborate this increased disparity of nonresearch industry payments within otolaryngology. Rathi et al22 found a 10-fold difference between the mean research payment and median research payment for otolaryngologists in 2015. This difference is greater than the discrepancy between the mean and median nonresearch payments in 2014 (6-fold) and 2015 (8-fold) that we found in our study.

We observed that the majority of nonresearch payments made to otolaryngologists can be attributed to food/beverage (89% in 2014 and 88% in 2015). These results are similar to those in plastic surgery, in which 82% of payments were attributed to food/beverage.31 Studies in radiation oncology and ophthalmology are also consistent with the finding that the most common payments are food/beverage.32,33 We further found that 5 of the top 10 highest-paying sponsors to otolaryngologists in 2014 made fewer
payments in 2015. This, with the increase in mean payment per compensated otolaryngologist, may indicate that some sponsors are attempting to make fewer payments of higher value. As future data are released through the Open Payments Database, assessments in sponsor payment trends can be conducted. Next, our US Census region findings showed that otolaryngologists in the Northeast region, an area with numerous academic centers, received the highest median payment in 2014 and 2015. Further investigation is necessary to assess how strong a determinant academic otolaryngology is on payment amount received.

Finally, we found that otolaryngologists received the second-lowest and lowest median payment per compensated surgeon in 2014 and 2015, respectively, when compared with other surgical specialists. Otolaryngologists also received the lowest mean payment per compensated otolaryngologist in both years, which is consistent with our group’s and Cvetanovich’s previous studies focusing on nonresearch payments. Our results are also similar to Rathi’s study, which found that otolaryngology received the second-lowest median research payment per compensated surgeon in 2015.

This study has a number of limitations. First, 2014 represents the first yearlong data set released in the Open Payments Database, and we recognize that it is difficult to draw definitive conclusions regarding the impact of the Sunshine Act on payments to otolaryngologists with 2 full calendar years of data. Second, it is possible that our results underestimate the level of industry support that surgeons receive, because we did not include research payments. Third, data are self-reported by industry, and there is no corrective algorithm in place for confirmation of the validity of sponsor underreporting of payments.
Table 3. Nonresearch Payments to Surgeons Characterized by Specialty and Stratified per Year.

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<tr>
<td>All surgeons</td>
<td>93,280</td>
<td>93,814</td>
<td>252 (965)</td>
<td>252 (988)</td>
<td>7510 ± 128,390</td>
<td>7703 ± 178,171</td>
</tr>
<tr>
<td>Orthopedic surgery</td>
<td>22,152</td>
<td>22,189</td>
<td>389 (1875)</td>
<td>405 (1860)</td>
<td>18,432 ± 207,986</td>
<td>18,688 ± 317,139</td>
</tr>
<tr>
<td>Neurosurgery</td>
<td>7328</td>
<td>7652</td>
<td>170 (1078)</td>
<td>117 (964)</td>
<td>12,667 ± 244,518</td>
<td>13,007 ± 267,302</td>
</tr>
<tr>
<td>Thoracic surgery</td>
<td>3677</td>
<td>3652</td>
<td>626 (2433)</td>
<td>696 (2509)</td>
<td>6222 ± 44,738</td>
<td>6989 ± 77,668</td>
</tr>
<tr>
<td>Plastic surgery</td>
<td>5395</td>
<td>5475</td>
<td>243 (589)</td>
<td>309 (851)</td>
<td>5202 ± 132,713</td>
<td>3914 ± 67,639</td>
</tr>
<tr>
<td>Vascular surgery</td>
<td>3182</td>
<td>3275</td>
<td>588 (1967)</td>
<td>618 (1928)</td>
<td>4674 ± 20,368</td>
<td>4822 ± 21,936</td>
</tr>
<tr>
<td>Urology</td>
<td>9433</td>
<td>9348</td>
<td>453 (1062)</td>
<td>410 (964)</td>
<td>3577 ± 21,942</td>
<td>3428 ± 25,302</td>
</tr>
<tr>
<td>Ophthalmology</td>
<td>14,718</td>
<td>14,738</td>
<td>200 (451)</td>
<td>194 (445)</td>
<td>2990 ± 27,907</td>
<td>4240 ± 95,318</td>
</tr>
<tr>
<td>General surgery</td>
<td>19,492</td>
<td>19,539</td>
<td>168 (757)</td>
<td>170 (736)</td>
<td>2381 ± 29,663</td>
<td>2113 ± 18,215</td>
</tr>
<tr>
<td>Otolaryngology</td>
<td>7903</td>
<td>7946</td>
<td>169 (346)</td>
<td>165 (377)</td>
<td>1096 ± 6098</td>
<td>1242 ± 8117</td>
</tr>
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Abbreviation: IQR, interquartile range.

Despite these limitations, this is the first study to characterize and compare payments within otolaryngology through 2 calendar-year data releases in the Open Payments Database. Otolaryngologists continue to demonstrate limited ties with industry as compared with other surgical specialists. In addition, the increase in the ratio of mean:median payment per compensated otolaryngologist from 2014 to 2015 suggests greater variation in payments. The number of compensated otolaryngologists as well as the mean payment per compensated otolaryngologist also increased in 2015. While it is difficult to draw conclusions about the impact of the Sunshine Act on physician behavior over time, some of the findings may be related to normal annual variation, a true increase in sponsors’ and otolaryngologists’ financial relationships (for a range of reasons), or simply improved reporting of physician payments. As additional years of data are released through the Open Payments Database, studies surveying physicians and assessing reporting modalities can assist in further exploring the industry-otolaryngologist relationship.

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Author Contributions
Neil Pathak, study conception and design, analysis and interpretation of data, drafting the article, revising manuscript critically for important intellectual content, final approval; Rance J. T. Fujiwara, analysis and interpretation of data, revising manuscript critically for important intellectual content, final approval; Saral Mehra, study conception and design, analysis and interpretation of data, drafting the article, revising manuscript critically for important intellectual content, final approval.

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Supplemental Material
Additional supporting information is available in the online version of the article.

References