Increasing Industry Involvement in Otolaryngology: Insights from 3 Years of the Open Payments Database

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Abstract

Objectives. To characterize industry payments to otolaryngologists in 2016 versus 2014 and 2015.

Study Design. Cross-sectional retrospective analysis.

Setting. Open Payments Database.

Subjects and Methods. Using the Open Payments Database, we identified otolaryngologists receiving payments from industry sponsors from 2014 to 2016. We characterized the number and value of payments per physician overall and by census region, as well as by sponsor subspecialty and payment type. Study years were compared via analysis of variance and Kruskal-Wallis tests. Trends in payments to otolaryngologists were compared with trends in 21 other specialties.

Results. Payment to otolaryngologists increased 67% from 2014 to 2016—from $8.7 million in 2014 to $9.9 and $14.5 million in 2015 and 2016, respectively (P < .001). While mean payment per compensated otolaryngologist increased ($1095, $1243, and $1834 in 2014, 2015, and 2016, respectively, P < .001), median payments stayed relatively constant ($169, $165, and $172), suggesting an increasingly unequal distribution. Much of the increase is accounted for by an increased number of payments for consulting fees and physician ownership. Most payments were made by companies specializing in rhinology. Otolaryngology received the lowest industry compensation per physician among the surgical specialties examined and lower compensation than most non-surgical specialties. The increase in payments to otolaryngologists was proportionally greater than all but 1 of the other 21 specialties examined.

Conclusions. Industry compensation to otolaryngologists is increasing and increasingly unequal, although it is still less than that in most other specialties. In otolaryngology, the Open Payments Database has not decreased physician-industry relationships as intended.

Keywords
industry, Open Payments Database, Sunshine Act, conflict of interest, industry interactions

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The Affordable Care Act, passed in 2010, put the Physician Payments Sunshine Act into place. This mandated the reporting of financial transactions between medical providers and industry sponsors to the Centers for Medicare and Medicaid Services (CMS) and made these data publicly available on the CMS website. This was passed to increase the transparency of potential conflicts of interest in medicine to make patients more informed and to deter physicians from holding financial relationships with pharmaceutical companies.1 However, public and physician knowledge of the database and reported transactions has been limited.2 Perhaps because of this, payments have stayed relatively steady since the first full-year data release in 2014.3 Physicians overwhelmingly report that practice patterns are not affected by industry financial relationships. However, multiple studies, including some focused on otolaryngologists, have correlated industry payments with physician behavior.4-8 We previously noted that otolaryngologists received significantly less industry compensation than other surgical specialties.9 With the recent release of the 2016 data, we are able to analyze the trends in compensation over time and compare these with other specialties.

In this study, we examined industry compensation to otolaryngologists over the first 3 years of the Open Payments Database. Specifically, we examined trends in payments over time and compared these trends with other specialties to see if the Sunshine Act has achieved its stated purpose in otolaryngology. We also analyzed changes in payment by region, payment type, and industry subspecialty to elucidate

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potential reasons for these changes and to identify potential ways in which these payments may affect physician behavior.

Methods

Data Source

The Physician Payments Sunshine Act collects information about payments made to physicians by drug and device companies for activities such as travel, research, meals, gifts, speaking fees, consulting, and ownership interests. Data are publicly available on the CMS website. This data set details all transactions >$10, including the receiving physician, basic demographic information, the industry sponsor, and any drug or device to which the payment was associated.

Data Selection

All nonresearch industry payments data were downloaded from the General Payments data sets in the 2014-2016 Open Payments Database. We included all physicians with a specialty falling under the umbrella of otolaryngology, including otolaryngology subspecialties. Only payments made to allopathic or osteopathic physicians were included. For comparative analysis, we included payments to physicians in other specialties: surgical (ophthalmology, dermatology, urology, plastic surgery, vascular surgery, thoracic surgery, neurosurgery, and orthopedic surgery) and nonsurgical (cardiology, gastroenterology, rheumatology, anesthesiaology, emergency medicine, radiology, pulmonology, hematology/oncology, infectious disease, obstetrics/gynecology, psychiatry, and neurology).

Variable Definitions

Each payment was characterized by the nature of payment as categorized by the CMS. Physician location was determined by the state of primary address and classified into West, Midwest, South, and North, based on US census definitions. Locations that did not fit into these categories (Alaska, Hawaii, Puerto Rico) were excluded from census-level analysis. Sponsors were characterized by product subspecialty—allergy, rhinoology, facial plastics, otology, surgical supplies/devices, and other/general—by examining the available products from that sponsor on the company website. Companies with products in multiple categories were categorized as other/general. Payment types were categorized as specified by the CMS, combining the different types of payments for “speaking fees.”

Statistical Analysis

For each year, we determined the sum of all nonresearch payments made to physicians in each specialty and calculated the relative change as compared with 2014 values. For otolaryngologists, we determined the number of compensated otolaryngologists each year and the mean and median dollar amounts and number of payments per compensated otolaryngologist. We calculated total payment amount to otolaryngologists in the top 1% and 10% versus the bottom 99% and 90% for payment values for each year. We classified payments by physician census region and characterized the total payment, number of compensated otolaryngologists, and mean payment per compensated otolaryngologist in each region. We classified payments by payment type (ie, food, consulting fees) and characterized the total value, number of payments, and mean value per payment in each category. We characterized the total value, number of payments, and mean value of payments by sponsor otolaryngology subspecialty. We also characterized the mean and median amounts of payment by company. We compared results between study years by analysis of variance and Kruskal-Wallis tests for means and medians, respectively. All statistical analysis was performed in STATA 15.0 (StataCorp, College Station, Texas). Statistical significance was determined at P < .05. These data are publicly available; therefore, institutional review board review was not required.

Results

Payment Trends in Otolaryngology as Compared with Other Specialties

Total payment to otolaryngologists increased from $8.7 million in 2014 to $9.9 million in 2015 and $14.5 million in 2016, an overall 67% increase. The total value of general payments in the database stayed relatively steady during this period, from $2.68 billion in 2014 to $2.67 and $2.78 in 2015 and 2016, respectively. Figure 1 shows trends in payments to otolaryngologists as compared with other specialties. Of the 21 other specialties analyzed, the only specialty with a higher relative increase was emergency medicine, with a 113% increase from $11.3 million in 2014 to $13.0 and $24.1 million in 2015 and 2016, respectively. After otolaryngology, the specialties with the next-highest relative increases were ophthalmology (46% increase) and dermatology (36% increase). Infectious disease, cardiology, neurosurgery, plastic surgery, vascular surgery, obstetrics/gynecology, and urology all had decreases in total payment from 2014 to 2016.

Payment Trends within Otolaryngology

While the total payment amount to otolaryngologists increased, the total number of payments stayed relatively constant at 73,406 in 2014, 65,354 in 2015, and 70,157 in 2016. The total number of compensated otolaryngologists varied minimally from 7907 in 2014 to 7941 and 7922 in 2015 and 2016, respectively. Mean payment per compensated otolaryngologist increased from $1095 (SD = $6096) in 2014 to $1243 (SD = $8120) in 2015 and $1834 (SD = $16,708) in 2016 (P < .001). Median payments per compensated otolaryngologist stayed relatively constant at $169 (interquartile range [IQR] = $62-$548), $165 (IQR = $65-$442), and $172 (IQR = $67-$492) in 2014, 2015, and 2016, respectively. This was a statistically significant but not financially meaningful difference (P = .002). There was
an increase in the discrepancy between mean and median payment values, from 6.5-fold in 2014 to 7.5- and 10.7-fold in 2015 and 2016, respectively, suggesting an increasingly unequal distribution.

Figure 2 shows the distribution of payments to the top 1% of compensated physicians. The mean (SD) and median (IQR) numbers of payments per compensated otolaryngologist also stayed relatively constant, at 9.3 (13.6), 8.2 (12.9), and 8.9 (14.2) in 2014, 2015, and 2016 (P < .001) and 5 (2-11), 4 (2-10), and 5 (2-11) in 2014, 2015, and 2016, respectively (P < .001). Despite statistical significance, they did not change in a financially meaningful way. When the subset of physicians receiving the highest 1% of compensation was analyzed separately, total payment increased from $3.7 million in 2014 to $4.5 and $8.0 million in 2015 and 2016, respectively: a 118% increase. In the bottom 90%, total payments increased from $1.6 million in 2014 to $1.8 and $2.0 million in 2015 and 2016, respectively.

By Census Region

Figure 3 shows trends by census region. There was a significant increase in mean payment per compensated otolaryngologist in the West, F(2, 4899) = 4.76 (P = .009), but not in the Northeast, F(2, 4471) = 1.45 (P = .2343), Midwest, F(2, 5060) = 1.55 (P = .2131), or South, F(2, 9153) = 2.96 (P = .521). The West had the highest mean payment per otolaryngologist all years and the greatest relative and absolute increase in total payment, from $2.0 million in 2014 to $2.3 and $4.3 million in 2015 and 2016, respectively. The Midwest had the smallest increase in total payments, from $1.8 million in 2014 to $2.1 and $2.5 million in 2015 and 2016.

By Payment Type

Table 1 shows trends in compensation by payment type. Food and beverage was the most common payment,
followed by travel and lodging. There was a significant increase in the mean value of payments for speaking fees, from $1428 (SD = $1110) in 2014 to $3062 (SD = $21,916) in 2016, and the number of payments for consulting fees, from 910 in 2014 to 1476 in 2016. The number and dollar amounts of payments for “current or perspective ownership” increased from 1 payment of $185,365 in 2014 to 14 payments with a mean value of $123,437 (SD = $94,997) in 2016, all of which were made by a single company. This accounted for 27% of the increase in payments to otolaryngologists. There was a decrease in number of payments for honoraria, from 493 in 2014 to 67 in 2016.

By Company
The mean (SD) payment per company increased from $487,969 ($314,575) in 2014 to $535,698 ($413,082) in 2015 and $612,155 ($497,066) in 2016. The median (IQR) payment per company, however, decreased from $620,790 ($121,393-$774,202) in 2014 to $539,933 ($142,569-$1,052,362) in 2015 and $572,173 ($111,481-$1,213,235) in 2016. In addition, the number of companies making payments to otolaryngologists decreased slightly, from 318 in 2014 to 325 in 2015 and 301 in 2016.

By Sponsor Specialty
Table 2 and Figure 4 show payments by sponsor specialty. Rhinology had the highest total number and total value of payments paid across all years. The total value of payments in rhinology increased from $2.3 million in 2014 to $4.2 million in 2016. All specialties had an increase of at least 1.8-fold from 2014 to 2016, but total number and value of payments in the general/other category stayed relatively steady, at $2.8 million in 2014 and $2.7 million in 2016.

Discussion
We show here that industry payments to otolaryngologists has increased since the first release of the Open Payments data, in contrast to the intended effect. This study is the first to show, by specialty, such remarkable increases in payments since the release of these public data, and it is interesting that payments in otolaryngology have been increasing out of proportion to payments in other specialties. Specifically, we found that the number of payments and number of compensated otolaryngologists remained steady and that there was an increase in the mean but not median value of payments per compensated otolaryngologist. We demonstrated that this increase is mostly attributable to large increases in certain payment types and subspecialties; however, it is also accounted for by a general increase in payment value across categories.

Overall, total payment to otolaryngologists increased 67% from 2014 to 2016: from $8.7 million in 2014 to $14.5 million in 2016. This increase was not seen in the overall database, in which there was only a 4% increase in payments over this period. Furthermore, the increase in payments to otolaryngologists was more than any of the 21 other specialties analyzed except for emergency medicine. We initially speculated that the observed increase was due to increased reporting of payments; however, our finding of no similar increase in other specialties suggests that this is not the case. Despite this increase, otolaryngologists continue to receive lower compensation as compared with other surgical specialties. Otolaryngologists also received lower payments than many of the nonsurgical specialties: of the 22 medical and surgical specialties analyzed, otolaryngology ranked 19 of 22 in mean payments per physician in 2014, which increased to 17 of 22 in 2016. Most other surgical and procedural specialties receive high values of industry payments. As a small specialty, otolaryngology may be less
likely to receive compensation from large multispecialty companies, which can affect product usage more through interactions with larger groups of physicians. With the rapid growth of the otolaryngology device market, industry relationships may just be beginning to markedly affect otolaryngologists’ practice. In the face of this rapid growth, we must as a specialty reassess acceptable and nonacceptable forms of industry interactions.

Despite the large increase in total payment values, there was no meaningful change in the median payment to each physician or in the number of compensated physicians. This suggests an increasingly unequal distribution, with a small proportion of physicians receiving high-value payments. When the top 1% of physicians was analyzed separately, we saw that payments increased by 118%, as opposed to just 31% in the bottom 99%. On post hoc analysis, we found that in 2014, the top 10% of physicians accounted for 81% of total payments versus 82% in 2015 and 86% in 2016. The top 1% accounted for 14%, 12%, and 21% of payments each year, respectively. This suggests that although high-

### Table 1. Trends in Compensation by Payment Type.\(^a\)

<table>
<thead>
<tr>
<th></th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Charity</td>
<td>5750</td>
<td>1917</td>
<td>7000</td>
<td>.264</td>
</tr>
<tr>
<td>Speaking fees</td>
<td>1,320,714</td>
<td>1428</td>
<td>2400</td>
<td>.016</td>
</tr>
<tr>
<td>Consulting</td>
<td>2,118,899</td>
<td>2328</td>
<td>2400</td>
<td>.082</td>
</tr>
<tr>
<td>Ownership</td>
<td>185,364</td>
<td>185,364</td>
<td>120,909</td>
<td>.475</td>
</tr>
<tr>
<td>Education</td>
<td>516,557</td>
<td>426</td>
<td>753</td>
<td>.012</td>
</tr>
<tr>
<td>Entertainment</td>
<td>425</td>
<td>25</td>
<td>54</td>
<td>.117</td>
</tr>
<tr>
<td>Food and beverage</td>
<td>2,002,916</td>
<td>34</td>
<td>37</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Gift</td>
<td>23,252</td>
<td>337</td>
<td>747</td>
<td>.006</td>
</tr>
<tr>
<td>Grant</td>
<td>56,100</td>
<td>2439</td>
<td>3333</td>
<td>.518</td>
</tr>
<tr>
<td>Honoraria</td>
<td>720,861</td>
<td>1462</td>
<td>2125</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Royalty</td>
<td>411,741</td>
<td>4380</td>
<td>5259</td>
<td>.548</td>
</tr>
<tr>
<td>Travel and lodging</td>
<td>1,292,013</td>
<td>353</td>
<td>368</td>
<td>&lt;.001</td>
</tr>
</tbody>
</table>

*Trends in total value of compensation to otolaryngologists and mean value of each payment to otolaryngologists by the type of payment. Means were compared across study years by analysis of variance.

### Table 2. Trends in Compensation by Subspecialty.\(^a\)

<table>
<thead>
<tr>
<th></th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allergy</td>
<td>40,379</td>
<td>60</td>
<td>59</td>
<td>.191</td>
</tr>
<tr>
<td>Facial plastics</td>
<td>91,431</td>
<td>104</td>
<td>104</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>General</td>
<td>2,772,317</td>
<td>103</td>
<td>103</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Otology</td>
<td>505,990</td>
<td>264</td>
<td>236</td>
<td>.173</td>
</tr>
<tr>
<td>Sinus</td>
<td>2,328,290</td>
<td>98</td>
<td>113</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Surgical devices</td>
<td>841,611</td>
<td>226</td>
<td>235</td>
<td>.016</td>
</tr>
</tbody>
</table>

*Trends in total amount of compensation and mean value per payment by otolaryngology subspecialty. Means were compared across study years by analysis of variance.

Pharmaceutical and device companies routinely target key influencers for large-value payments, under the assumption that these individuals’ practice patterns have a ripple effect on others. Some highly compensated physicians participate in academic society leadership and chair clinical practice guideline committees, which may magnify the effects of industry relationships.\(^{11-16}\) Multiple studies have correlated industry payments to physicians and prescribing patterns at a hospital referral region level, suggesting that this may be the case. Fleischman et al found that payments to physicians were associated with greater regional prescribing of drugs and that these associations were strongest with payments to specialists and with high-value payments for speaking and consulting fees.\(^{17}\) Otolaryngologists are
increasingly being compensated for speaking and consulting, and this work suggests that engagements may be influencing practice patterns within the specialty and beyond. On post hoc analysis, we found that the increase in payments for consulting, speaking, and travel payments was particularly notable in the Western United States, where the total value for these 3 payment types increased 2-fold, from $1.2 million in 2014 to $2.5 million in 2016. Many of these physicians may be valuing their time differently and may have shifted focus from patient care to drug and device development. Despite this, these payments are known to be associated with practice patterns. In an increasingly cost-constrained health care system, the implications of these engagements must continue to be examined.

There were large increases in all subspecialty payments but not in payments by companies producing general otolaryngology products. Rhinology accounted for $1.9 million of the increase in payments, while the next-highest subspecialty, otolaryngology, accounted for $485,000. The otolaryngologic drug and device sector is rapidly growing, and the influx of new companies and devices to the market likely accounts for some of the increased expenditure. While the number of companies making payments to otolaryngologists did not increase over the study period, the overall value of the otolaryngologic device market has been increasing; therefore, companies may have a bigger budget dedicated to physician sponsorship.18 This likely contributes to some of the trends seen here. If these payments are linked to increased device usage, as has been shown previously, this increase in payments may lead to an increased cost of care without commensurate improved patient outcomes.

There was little change in the number or value of food and beverage payments, which were the most frequent payments but low value. Multiple studies have associated these small payments to significant changes in prescribing patterns, particularly among specialists.19 The findings here suggest that, at least in otolaryngology, the public release of these data has not inhibited these small-value industry-physician interactions. Few payments were made for charity, grants, royalty, and entertainment; therefore, this study may have been underpowered to detect trends in these payment categories.

Physicians have largely reacted negatively to the Open Payments Database, claiming that the information may be taken out of context and that payments from industry do not affect physician decision making. However, studies in a variety of specialties and contexts have shown this to be untrue.7,20-23 Even small amounts of compensation, such as free meals, have been correlated to physician prescription of brand-name drugs, and payments from device companies have been associated with performance of specific procedures.19 Industry certainly plays a key role in health care. Free meals are often provided during educational lectures and continuing medical education events. However, these advantages must be balanced against the conflicts of interest that they inevitably generate. The Sunshine Act was “intended to help patients make more informed decisions and to deter financial relationships that might inflate health care costs.”3,24 Few patients are aware of the database, and fewer have looked up their doctors.2 This study shows that the second goal, deterring physician conflicts of interest, has also not been met, at least in otolaryngology.

There are multiple limitations to this study. Only 3 years of data are available; therefore, the trends identified may be normal fluctuations. Subsequent years of data should be examined to confirm the patterns found here. There have been some concerns about the accuracy of the data reported, which would affect the conclusions drawn. Our results may underestimate industry interactions due to our exclusion of research data. The trends identified here may represent changes in pharmaceutical reporting patterns rather than changes in industry payments; however, one would expect them to be seen in other specialties were that the case. Last, we are unable to ascertain the reasons for changes in payment amounts, and further work should explore this issue.

**Conclusion**

In this study, we used the Open Payments Database to analyze trends in industry compensation to otolaryngologists (2014-2016). Compensation has increased 67%, from $8.7 to $14.5 million, which is more than all but 1 of the other specialties examined. Much of the increase in payments can be attributed to a few
highly compensated physicians and an increase in payments for high-value consulting and speaking fees. In otolaryngology, the public release of payments data has not decreased physician-industry relationships. Industry payments have been linked to physician practice patterns, and the increased industry ties noted here may lead to unnecessarily costly care.

Author Contributions

Elliot Morse, conception and design; acquisition, analysis, interpretation of data; drafting of manuscript; final approval, agreement to be accountable; Rance J. T. Fujiwara, conception and design, data acquisition and analysis, drafting of manuscript, critical revision of manuscript, final approval, agreement to be accountable; Saral Mehra, conception and design, drafting of manuscript, critical revision of manuscript, final approval, agreement to be accountable.

Disclosures

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