



Plastic Surgeons and their Financial Relationships with the Industry in the era of COVID: Insights from the Physician Payments Sunshine Act



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Abstract

Background The impact of the COVID-19 pandemic on physician relationships with industry and subsequent financial implications has not been previously assessed. The aim of this study is to compare pre- and post-COVID-19 payments between industry and medical providers for all plastic surgeons.

Methods Payment information was collected for the 2019 and 2020 reporting periods from the Open Payments Program (OPP) database for plastic surgeons and plastic surgeon subspecialists. An analysis was performed of trends and comparison of payments for each year for all plastic surgeons and each subspecialty cohort.

Results For all plastic surgeons, there was a decrease in industry payments between 2019 and 2020 (– 30.5%). All plastic surgery subspecialties had a decrease in payments with general plastic and reconstructive surgery affected the most (– 56%) and craniofacial surgery affected the least (– 9%). Payments for almost all categories for plastic surgeons decreased along with compensation as faculty or as speakers. Total charitable contributions and grant payments increased by 61 and 273%, respectively.

Conclusion Analysis of industry–physician payments available through the Sunshine Act shows that the COVID-19 pandemic has significantly impacted industry payments to plastic surgery and its subspecialties. While this study demonstrates the economic impact of the current pandemic, only time will tell whether these trends will persist in the coming years.

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Keywords COVID-19 · Plastic surgery · Economic impact · Pandemic · Physician payments sunshine act

Introduction

Beyond the clinical challenges seen as a result of coronavirus disease 19 (COVID-19), the ongoing pandemic has also brought about formidable financial challenges for all sectors of the US economy, including the healthcare industry [1]. The enactment of epidemic control strategies to limit viral spread, including social distancing, and postponement of non-emergent and elective procedures and visits, has helped to reduce transmission and free up valuable healthcare resources.

The majority of plastic surgery procedures and visits are considered elective with 75–85% of practitioners in a solo or private practice group business model [2]. As a result, unsurprisingly, plastic surgeons across the board have seen fewer patients and performed fewer surgeries in the months immediately following the COVID-19 pandemic [3]. This substantial drop in patient access coupled with continued

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financial overhead carried by many practicing plastic surgeons has had a significant impact on the financial stability of plastic surgery practices [4]. Several policies have been enacted to help prevent collapse of the healthcare system, including several physician-specific grants and loans developed to keep small businesses afloat as they continue to navigate through economic hardships [3]. While the operational and financial impacts of COVID-19 on the healthcare system are evident, the impact of the pandemic on physician relationships with industry and their subsequent financial implications has not been assessed. Plastic surgery-specific trends in industry payments during the COVID-19 pandemic have not been quantified.

The aim of this study is to compare pre- and post-COVID-19 payments between industry and medical providers for all plastic surgeons and for plastic surgeons in specific subspecialties using the Open Payments Program (OPP) database, under the Physician Payments Sunshine Act [5, 6]. The authors hypothesize that the number of payments for all plastic surgeons, as well as all payment types will be significantly decreased following the COVID-19 outbreak.

Methods

The Centers for Medicare and Medicaid Services (CMS) Open Payment Program (OPP) database [6] was queried for industry-related payments made to physicians in 2019 and 2020 on July 14, 2021. Data were retrieved for all allopathic and osteopathic (MD and DO) physicians, practicing in the USA, including Alaska and Hawaii, but excluding payments to physicians residing in countries outside of the USA or in minor outlying islands. Payments made to physicians who indicated ownership or investment interests (involving the recipient physician or immediate family members) in the applicable manufacturers, or group purchasing organizations were excluded.

Payment information was collected for the 2019 and 2020 reporting periods, which captured data from January 1 to December 31 of the corresponding year. Physician-level payments were aggregated using unique physician identification numbers. The main cohort identified and analyzed was of plastic surgeons whose reported profession in the OPP database was: Plastic Surgery, Plastic Surgery-Hand, Plastic Surgery of the Head and Neck (Craniofacial), Otolaryngologists specializing in Facial Plastic Surgery (Oto), and Plastic and Reconstructive Surgery.

Data were aggregated for relative differences in yearly totals, number of payments, number of physicians receiving payment, type of payments, and geographic distribution. The sum, mean, standard deviation (SD), and total number of general payments received per plastic surgeons

were calculated for both 2019 (pre-pandemic year) and 2020 (pandemic year). Relative differences (RD) in the general payments were calculated using data from 2019 to compare the general payments pre- and post-pandemic. Mann–Whitney U test was employed for statistical analysis of the data. All statistical analyses were performed on R software (R Foundation, Vienna, Austria) and the level of significance was set at p value < 0.05 .

Results

Total payment to all plastic surgeons decreased from \$47,929,752.87 with 72,044 payments reported in 2019, to \$33,319,238.14 with 29,946 payments in 2020. This represents a relative difference in total payment of -30.5% which was statistically significant based on the Mann–Whitney U test ($p < 0.0001$, Table 1).

Tables 2 and 3 depict the breakdown of payments for plastic surgeons based on their subspecialty. Table 4 shows the relative differences from 2019 to 2020 for the different subspecialties ranging from -55.85% (Plastic and Reconstructive Surgery) to -9.40% (Plastic Surgery Within the Head and Neck). These changes were statistically significant based on the Mann–Whitney U test.

With regard to the nature of payment, payments for “Charitable Contribution” and “Grants” were the only payment types that increased from 2019 to 2020; however, these changes were not statistically significant (Table 5).

Discussion

The COVID-19 pandemic has resulted in a rapidly evolving global health crisis that has necessitated swift action in response to unprecedented challenges faced by our healthcare systems and its employees. Due to guidelines and measures enacted to conserve limited healthcare resources and slow the spread of COVID-19, plastic surgeons have seen a significant decrease in patient access and surgical caseloads as a result of cancellations and postponements of elective and routine procedures [3]. Based on these financial implications, we hypothesized that industry payments to plastic surgeons would also be negatively impacted by the pandemic, similar to other financial strains faced by plastic surgeons due to COVID-19. The public reporting of payments made by industry to physicians has previously been used as a tool to study trends and provide insight on industry–provider relationships in the field of plastic surgery [7, 8]. However, the impact of the COVID-19 pandemic on industry payments to plastic surgeons has not been previously reported. Thus, to better understand the impact of COVID-19 on industry–physician relationships,

Table 1 Payments to all plastic surgeons in 2019 and 2020

	Financial year 2019	Financial year 2020
Number of physicians included	6437	5076
Number of unique payments	72,044	29,946
Total amount of payments (in US dollars)	47,929,752.87	33,319,238.14
Average total amount and SD (per unique physician, in US dollars)	7551.56 (261,995.59)	6564.07 (269,048.91)
Median total amount and IQR (per unique physician, in US dollars)	295.33 (100.38–1164.55)	133.43 (42.52–367.99)

SD Standard deviation, *IQR* Interquartile range

Table 2 Payments to all surgeons by surgical specialty in 2019 in US dollars

Financial year 2019						
Subspecialty	Total payments	(%)	Average payment	SD	Median	IQR
Facial plastic surgery	1,527,891.22	3.19	289.37	1,095.87	24.99	14.67–113.87
Plastic surgery	16,454,521.17	34.33	373.36	6,077.67	24.74	14.15–97.92
Plastic surgery within the head and neck	21,079,833.09	43.98	20,768.31	325,442.56	18.86	12.64–73.08
Surgery of the hand	1,460,766.62	3.05	737.39	9,886.85	41.28	17.69–108.94
Plastic and reconstructive surgery	7,406,740.77	15.45	376.03	3,792.43	27.00	14.73–98.82

SD Standard deviation, *IQR* Interquartile range

Table 3 Payments to all surgeons by surgical specialty in 2020 in US dollars

Financial year 2020						
Subspecialty	Total payments	(%)	Average payment	SD	Median	IQR
Facial plastic surgery	821,510.40	2.47	324.71	1,267.40	21.53	14.48–71.45
Plastic surgery	9,151,737.20	27.47	506.80	11,661.29	21.52	14.61–87.99
Plastic surgery within the head and neck	19,098,469.53	57.32	42,253.25	479,960.64	19.44	14.21–50.91
Surgery of the hand	977,420.06	2.93	1,294.60	15,356.20	24.68	14.88–124.94
Plastic and reconstructive surgery	3,270,100.95	9.81	401.19	4,621.66	21.56	14.70–85.05

SD Standard deviation, *IQR* Interquartile range

Table 4 Relative difference of total payment from 2019 to 2020 per specialty

Subspecialty	Relative differences	<i>p</i> value*
Facial plastic surgery	– 46.23	< 0.0001
Plastic surgery	– 44.38	< 0.0001
Plastic surgery within the head and neck	– 9.40	0.3513
Surgery of the hand	– 33.09	0.0005
Plastic and reconstructive surgery	– 55.85	< 0.0001

**P* value generated from Mann–Whitney U test

our study compared and analyzed industry payments to plastic surgery and its subspecialties immediately pre- and post-pandemic.

Total payments made between industry and all physicians decreased from 2019 to 2020, including those in the field of plastic surgery and all of its subspecialties. General payments consist of payments made to physicians by

Table 5 Nature of payments to all surgeons in 2019 and 2020, and relative differences in US dollars

Specialty	Total payments in 2019	Total payments in 2020	Relative difference	<i>p</i> value
Charitable contribution	14,477.84	23,366.18	61.39	0.402
Compensation for services other than consulting, including serving as faculty or as a speaker at a venue other than a continuing education program	5,350,378.69	1,692,692.88	– 68.36	0.0322
Compensation for serving as faculty or as a speaker for a non-accredited and noncertified continuing education program	83,150.61	42,900.00	– 48.41	0.2675
Compensation for serving as faculty or as a speaker for an accredited or certified continuing education program	58,150.00	22,534.00	– 61.25	< 0.0001
Consulting fee	6,949,269.82	4,537,770.68	– 34.70	< 0.0001
Current or prospective ownership or investment interest	753,400.00	730,000.00	– 3.11	Not estimable
Education	156,786.70	108,813.68	– 30.60	0.9557
Entertainment	2,317.66	817.82	– 64.71	0.0033
Food and beverage	2,642,620.28	1,127,276.60	– 57.34	< 0.0001
Gift	4,074,952.29	440,842.83	– 89.18	< 0.0001
Grant	187,184.99	697,377.52	272.56	0.2909
Honoraria	300,321.68	252,684.07	– 15.86	< 0.0001
Royalty or license	25,037,466.43	23,252,352.68	– 7.13	0.8599
Travel and lodging	2,319,275.88	389,809.20	– 83.19	< 0.0001

P value generated from Mann–Whitney U test

companies with a Medicare- or Medicaid-covered product. These include royalty and licensing fees, consulting fees, food and beverage, travel, lodging, and gifts. General plastic and reconstructive surgery payments were most affected, while payments to plastic surgery within head and neck surgery were least affected.

As a result of social distancing and other safety measures, a reduction in in-person interaction between industry and physicians was likely a major contributing factor to the decrease in overall payments made to plastic surgeons. This is reflected in the reduction in the overall number of general payments made to physicians. Payment by type of industry allocation decreased for most categories, including serving as faculty or speaker at a venue for, or not for, continuing education programs, as well as compensation for entertainment, food, and beverages. Due to social distancing measures and travel restrictions aimed to reduce the spread of COVID-19, payment decrease in these categories was expected [9]. Widespread cancellations of conferences and guest lecture travel appointments as well as intra-institution gatherings that might have food and beverages provided occurred following the pandemic outbreak [10]. The COVID-19 pandemic-related restrictions also reduced the opportunity for plastic surgeons to conduct and receive payment for live training and reimbursement for attending industry-sponsored in-person educational sessions. While there have been many

initiatives to preserve the sharing of ideas and innovation via online resident education meetings and virtual conference platforms, the cost of these efforts is substantially less than those of their in-person counterparts [11–14].

Aside from the reduction in in-person activities, another likely contributing factor to the decline in general payments made to plastic surgeons during the pandemic is the reduction in elective surgery caseloads. Indeed, one study which looked at 140 plastic surgeons in California found that private practice surgeons experienced a 79% reduction in case-related income during the COVID-19 era and nonprivate practice plastic surgeons experienced a 37% reduction [2]. With reduced caseloads comes a reduced use of many medical devices often required during surgery. As such, general payments made to physicians for royalty or license fees that are based on sales of products would be expected to decrease as well.

With regard to the differences observed among the unique plastic surgery subspecialties, head and neck surgery payments decreased; however, the difference between 2019 and 2020 was much less compared to that of other subspecialties. This trend may be related to the fact that a large subset of craniofacial cases is considered to be urgent or emergent such as certain facial trauma, oncologic reconstructions, and some pediatric craniofacial surgery. Guidelines have been suggested specifically for craniofacial surgery, indicating a larger gray zone in case priority

for this specialty compared to other plastic surgery fields [15, 16]. For example, delay in cleft palate surgery may lead to suboptimal speech outcomes, but agreement on what length of delay or what outcomes may be appreciated differs among surgeons [17]. As such, the number of cases, and in turn industry payments, within this subspecialty may have been less affected. Perhaps another explanation for this relatively less significant decrease may be that the database shows significantly more payments from industry to Plastic Surgeons within Head and Neck in general. However, it should be noted that the combined group of non-subspecialized Plastic Surgeons (Plastic Surgery, Plastic and Reconstructive Surgery) had among all the highest amount of payments. This group potentially includes surgeons with focus on breast or lower extremity reconstruction, body contouring, and gender affirmation surgery.

Increases in industry payments were appreciated in two categories: total charitable contributions and grant payments, which, in the latter, more than doubled. Some funding may have been used to reimburse losses due to the COVID-19 outbreak as has been seen in other related medical fields such as dentistry [18]. These payments may also have been allocated widely in attempts to provide support to the study and research related to the COVID-19 disease in all patient populations. Many academic plastic surgery divisions have been able to maintain or increase their research productivity due to a combination of decreased time spent operating, the use of virtual platforms for streamlined communication with research teams, and an abundance of novel queries related specifically to the impact of COVID-19 on the profession [19]. To illustrate research productivity, when performing a PubMed search of the term “COVID-19,” nearly 200,000 publication results are returned, and when searching “COVID-19 AND Plastic Surgery,” over 1000 publication results are returned. Furthermore, in cases in which research was halted, researchers have been able to focus their efforts on grant application and manuscript writing leading to further increases in industry payments [19].

Conclusion

The COVID-19 pandemic has resulted in an unprecedented financial challenge to both the healthcare system as a whole and to individual medical specialties and subspecialties. As quantified by the OPP database under the Physician Payments Sunshine Act, the nature of physician industry payments has changed, as grants and research funding have increased while other categories of payments have decreased from 2019 to 2020 likely in response to COVID-19. Only time will tell whether these decreases in industry

funding will persist in the coming years given the unknown impact and course of the COVID-19 virus.

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Declarations

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Ethical Approval This study conforms to the Declaration of Helsinki ethical principles for medical research.

Human and Animal Rights This article does not contain any studies with human participants or animals performed by any of the authors.

Informed consent For this type of study, informed consent is not required.

References

1. Chamorro-Petronacci C, Martin Carreras-Presas C, Sanz-Marchena A et al (2020) Assessment of the economic and health-care impact of COVID-19 (SARS-CoV-2) on public and private dental surgeries in Spain: a pilot study. *Int J Environ Res Public Health*. <https://doi.org/10.3390/ijerph17145139>
2. Crowley JS, Reghunathan M, Kadakia N, Barttelbort S, Gosman A (2021) Financial decisions and reopening a practice during the COVID-19 pandemic: a survey of California plastic surgeons. *Ann Plast Surg* 86:354–359. <https://doi.org/10.1097/sap.0000000000002859>
3. Satiani B, Zigrang TA, Bailey-Wheaton JL (2020) COVID-19 financial resources for physicians. *J Vasc Surg* 72(4):1161–1165. <https://doi.org/10.1016/j.jvs.2020.04.482>
4. Al Bayati MJ, Samaha GJ, Wo LM et al (2021) Operational and financial impact of COVID-19: a survey of plastic surgeons in Miami. *Plast Reconstr Surg Glob Open* 9(7):e3742. <https://doi.org/10.1097/gox.0000000000003742>
5. Agrawal S, Brennan N, Budetti P (2013) The sunshine act—effects on physicians. *N Engl J Med* 368(22):2054–2057. <https://doi.org/10.1056/NEJMp1303523>
6. Centers for Medicare & Medicaid Services. Open Payments. Available at <https://openpaymentsdata.cms.gov/>. Accessed 14 July 2021
7. Pettit RW, Kaplan J, Delancy MM et al (2022) Industry payments to plastic surgeons: what has changed over the last 6 years following implementation of the physician payments sunshine act? *Aesthet Surg J* 42(2):210–221. <https://doi.org/10.1093/asj/sjab158>
8. Singerman KW, Moore MG, Kortlever JTP, Gobble RM (2022) Industry payments to plastic surgeons, 2013 to 2018: who’s getting paid? *Plast Reconstr Surg* 149(1):264–274. <https://doi.org/10.1097/prs.00000000000008683>
9. Mohan AT, Vyas KS, Asaad M, Khajuria A (2020) Plastic surgery lockdown learning during coronavirus disease 2019: are adaptations in education here to stay? *Plast Reconstr Surg Glob Open* 8(7):e3064. <https://doi.org/10.1097/gox.0000000000003064>

10. Hamidian Jahromi A, Arnautovic A, Konofaos P (2020) Impact of the COVID-19 pandemic on the education of plastic surgery trainees in the United States. *JMIR Med Educ.* 6(2):e22045. <https://doi.org/10.2196/22045>
11. Wlodarczyk JR, Wolfswinkel EM, Carey JN (2020) Coronavirus 2019 video conferencing: preserving resident education with online meeting platforms. *Plast Reconstr Surg* 146(1):110e–111e. <https://doi.org/10.1097/prs.0000000000007073>
12. Zargaran D, Zargaran A, Phillips G, Theofanis AP, Atkins J (2021) COVID-19: a unique opportunity to upgrade medical conferences. *J Plast Reconstr Aesthet Surg* 74(3):644–710. <https://doi.org/10.1016/j.bjps.2020.08.135>
13. Sung CW, Huang JJ, Mao SH et al (2021) International microsurgery club webinar series-bridging the knowledge gap during the COVID-19 pandemic. *J Reconstr Microsurg.* <https://doi.org/10.1055/s-0041-1732427>
14. Siotos C, Reid RR, Corcoran JF, Ko J, Agnew SP, Dorafshar AH (2021) Does pandemic crisis mean education crisis? The Chicago academic plastic surgery collaborative response to COVID-19. *Plast Reconstr Surg* 147(6):1469–1471. <https://doi.org/10.1097/prs.0000000000007980>
15. Zimmerman CE, Humphries LS, Taylor JA (2020) A tiered system to guide prioritization of pediatric cleft and craniofacial cases in COVID-19. *Plast Reconstr Surg* 146(3):392e–394e. <https://doi.org/10.1097/prs.0000000000007218>
16. Liu MT, Morrison SD, Susarla SM (2020) Considerations for management of craniomaxillofacial trauma in COVID-19 patients. *Plast Reconstr Surg* 146(2):248e–250e. <https://doi.org/10.1097/prs.0000000000007076>
17. Breugem C, Smit H, Mark H et al (2020) Prioritizing cleft/craniofacial surgical care after the COVID-19 pandemic. *Plast Reconstr Surg Glob Open* 8(9):e3080. <https://doi.org/10.1097/gox.0000000000003080>
18. Farooq I, Ali S (2020) COVID-19 outbreak and its monetary implications for dental practices, hospitals and healthcare workers. *Postgrad Med J* 96(1142):791–792. <https://doi.org/10.1136/postgradmedj-2020-137781>
19. Berman ZP, Diep GK, Alfonso AR et al (2021) Plastic surgery amidst the pandemic: the New York University experience at the epicenter of the COVID-19 Crisis. *Plast Reconstr Surg* 148(1):133e–139e. <https://doi.org/10.1097/prs.0000000000008060>

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