

APPENDIX 1. LIST OF OPIOID ANALGESICS AND BENZODIAZEPINES INCLUDED IN ANALYSES

Opioid analgesics included benzhydrocodone, buprenorphine, butorphanol, codeine, dihydrocodeine, fentanyl, hydrocodone, hydromorphone, levorphanol, mperidine, methadone, morphine, labuphine, opium, oxycodone, oxymorphone, pentazocine, propoxyphene, sufentail, tapentadol, tramadol. Buprenorphine formulations indicated for opioid use disorder were excluded, as were opioid cough-and-cold medications.

Benzodiazepines included alprazolam, chlordiazepoxide, clobazam, clonazepam, clorazepate, diazepam, estazolam, flurazepam, lorazepam, midazaloam, oxazepam, quazepam, temazepam, and triazolam.

APPENDIX 2. SAMPLE INCLUSION AND EXCLUSION CRITERION

Among the 10,979,804 opioid prescriptions dispensed in 2019 in the IQVIA Longitudinal Prescription Database, we excluded 243,061 (2.2%).

- 140,933 were for patients who lived outside of the 50 states and the District of Columbia
- 22,976 were written by dentists who practiced outside of the 50 states and the District of Columbia
- 78,233 were for patients aged 0–12 years
- 869 had invalid dosing information

APPENDIX 3. ADDITIONAL ANALYSES REGARDING HIGH-RISK PRESCRIPTIONS

Upon a reviewer's request, we conducted an additional analysis and found that 5.6% of opioid prescriptions from dentists overlapped with another opioid prescription for at least one day (regardless of whether the opioid prescription was written by the same dentist). Among the 5.6% of opioid prescriptions that overlapped with another opioid prescription, 9.7% were paid with cash, compared with 9.0% of the 94.4% of prescriptions that were not paid with cash.

Additionally, we calculated the proportion of all high-risk and non-high-risk prescriptions that were paid with cash. These proportions were similar, at 9.1% versus 8.9%.

APPENDIX 4. RESULTS WHEN RESTRICTING TO PRESCRIPTIONS WRITTEN BY ORAL AND MAXILLOFACIAL SURGEONS.

In 2019, 3,062,018 opioid prescriptions written by 5,819 oral and maxillofacial surgeons. Of these, 527,767 (17.2%) were written by the 291 high-volume oral and maxillofacial surgeons with prescription counts in the 95th percentile or above among all oral and maxillofacial surgeons accounting for dispensed opioid prescriptions in 2019. Among the 1,209,532 high-risk prescriptions written by oral and maxillofacial surgeons, 257,999 (21.3%) were written by high-volume oral and maxillofacial surgeons.

Unadjusted Demographic and Practice Characteristics Among High-Volume Oral and Maxillofacial Surgeons (OMFS) Versus Other Oral and Maxillofacial Surgeons

Provider characteristics	High-volume OMFS	Other OMFS	All OMFS accounting for ≥1 dispensed opioid prescription in sample
	N=291 n (%)	N=5,528 n (%)	N=5,819 n (%)
Age, years (based on year of birth)			
30–39	67 (23.0)	703 (12.7)	770 (13.2)
40–49	93 (32.0)	895 (16.2)	988 (17.0)
50–59	52 (17.9)	1,115 (20.2)	1,167 (20.1)
60–69	30 (10.3)	988 (17.9)	1,018 (17.5)
70–75	4 (1.4)	328 (5.9)	332 (5.7)
Unknown/Missing	45 (15.5)	1,499 (27.1)	1,544 (26.5)
Sex			
Male	288 (99.0)	5,005 (90.5)	5,293 (91.0)
Female	3 (1.0)	497 (9.0)	500 (8.6)
Unknown/Missing	0 (0.0)	26 (0.5)	26 (0.4)
Practice size			
1	88 (30.2)	1,679 (30.4)	1,767 (30.4)
2	80 (27.5)	1,146 (20.7)	1,226 (21.1)
3	45 (15.5)	643 (11.6)	688 (11.8)
4	21 (7.2)	382 (6.9)	403 (6.9)
5	15 (5.2)	179 (3.2)	194 (3.3)
6	10 (3.4)	115 (2.1)	125 (2.1)
7	3 (1.0)	48 (0.9)	51 (0.9)
8	2 (0.7)	26 (0.5)	28 (0.5)
9	1 (0.3)	22 (0.4)	23 (0.4)
10–99	1 (0.3)	188 (3.4)	189 (3.2)
≥100–3,588	3 (1.0)	339 (6.1)	342 (5.9)
Unknown	22 (7.6)	761 (13.8)	783 (13.5)
Office region			
Northeast	58 (19.9)	1,311 (23.7)	1,369 (23.5)

Appendix
Distribution of Opioid Prescribing and High-Risk Prescribing Among U.S. Dentists in 2019
Chua et al.

Midwest	66 (22.7)	1,091 (19.7)	1,157 (19.9)
South	126 (43.3)	1,913 (34.6)	2,039 (35.0)
West	41 (14.1)	1,213 (21.9)	1,254 (21.6)
Urban/rural office location			
Urban	291 (100.0)	5,519 (99.8)	5,810 (99.8)
Rural	0 (0.0)	5 (0.1)	5 (0.1)
Unknown	0 (0.0)	4 (0.1)	4 (0.1)

Appendix
Distribution of Opioid Prescribing and High-Risk Prescribing Among U.S. Dentists in 2019
Chua et al.

Factors Associated With Being a High-Volume Oral and Maxillofacial Surgeon

Urban/rural location was dropped from the regression because there were no rural high-volume oral and maxillofacial surgeons. Similar to the main analysis, being male, younger, and practicing in the South were associated with a higher odds of being a high-volume OMFS. Practicing in the West was associated with a lower odds of being a high-volume dentist, as was practice size of 5 or greater compared with solo practice.

Factor	AOR (95% CI)
Sex	
Male	ref
Female	0.09 (0.03, 0.27)
Age group, years	
30–39	ref
40–49	1.02 (0.73, 1.42)
50–59	0.49 (0.34, 0.72)
60–69	0.33 (0.22, 0.52)
≥70	0.19 (0.08, 0.47)
Region	
Northeast	ref
Midwest	1.31 (0.91, 1.89)
South	1.39 (1.01, 1.93)
West	0.64 (0.43, 0.98)
Practice size	
1	ref
2	1.19 (0.86, 1.64)
3	1.16 (0.80, 1.70)
4	0.89 (0.54, 1.46)
≥5	0.64 (0.42, 0.97)