WASHINGTON STATE HEALTH SERVICES RESEARCH PROJECT

Pharmacy Quality Alliance Opioid Prescribing Measurers in Washington State, 2014-18

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Introduction

In light of the current opioid crisis and ongoing debate regarding prescribing guidelines,[1] it is important to monitor opioid use and prescribing practices using reliable performance measures. Measures used should accurately identify patients at high risk for opioid abuse or overdose, such as those with high-dose opioid prescriptions, while allowing for cases where such use is appropriate, as in cancer or hospice patients. Measures should allow for meaningful comparisons over time, among subpopulations within Washington state, and against chosen benchmarks or target values.

The following opioid prescribing measures were developed by the Pharmacy Quality Alliance (PQA)[2] and are endorsed by the National Quality Forum.[3]

- Concurrent use of opioids and benzodiazepines among opioid patients without cancer (COB)
- Opioid use at high dosage among opioid patients without cancer (OHD)
- Opioids from multiple providers among opioid patients without cancer (OMP)
- Opioids at high dosage and from multiple providers among opioid patients without cancer (OMPHD)
- High dose initial opioid prescription (IOP-HD)
- Long duration initial opioid prescription (IOP-LD)
- Long acting initial opioid prescription (IOP-LA)

The first four measures, COB, OHD, OMP and OMPHD, are measured among established opioid patients with two or more prescriptions in the calendar year for a total of at least 15 days' supply. The remaining three measures, IOP-HD, IOP-LD and IOP-LA are among initial opioid patients, having at least one opioid prescription with no other opioid prescriptions in the previous 90 days. Patients in hospice, or with diagnoses of cancer or sickle cell anemia are excluded from all measures. All measures were calculated using data from the Washington All-Payer Claims Database. Technical details are provided in the appendix.

Results

Washington state rates for all measures except OHD have declined or held steady from 2014 through 2019. Among established opioid patients, OMP and COB rates declined between 2014 and 2019 while OHD rates have remained unchanged. The combination OMPHD was rare (Table 1). Among initial opioid patients, IOP-HD, IOP-LD, and IOP-LA rates all declined between 2015 and 2019. IOP-LA was rare (Table 2). IOP measures could not be calculated for 2014, because 2013 data needed to determine initial prescriptions were not available.

[1] Rubin, R. Limits on opioid prescribing leave patients with chronic pain vulnerable. *JAMA* 2019; JAMA. 2019; 321(21):2059-2062.
[2] Pharmacy Quality Alliance. 5911 Kingstowne Village Parkway, Suite 130, Alexandria, VA, USA 22315, 703.347.7963, www.pqaalliance.org.
[3] National Quality Forum. 1030 15th St NW Suite 800, Washington DC, 20005, USA. 202-783-1300. http://www.qualityforum.org.

Table 1. PQA Opioid Prescribing Measures in Washington State, 2014-2019

	2014	2015	2016	2017	2018	2019
Established Opioid Patients*	158,641	168,944	142,748	141,207	113,552	94,973
OHD Count (Percent)	4,257 (2.7)	4,645 (2.7)	4,152 (2.9)	3,643 (2.6)	3,223 (2.8)	2,524 (2.7)
OMP Count (Percent)	6,577 (4.1)	8,948 (5.3)	6,473 (4.5)	6,182 (4.4)	3,935 (3.5)	2,213 (2.3)
COB Count (Percent)	24,736 (15.6)	26,283 (15.6)	21,773 (15.3)	19,512 (13.8)	14,237 (12.5)	10,805 (11.4)
OMPHD Count (Percent)	262 (0.17)	303 (0.18)	222 (0.16)	198 (0.14)	135 (0.11)	71 (0.07)

*Two or more opioid prescriptions totaling over 15-day supply in the year.

Table 2. PQA Initial Opioid Prescribing Measures in Washington State, 2015-2019

	2015	2016	2017	2018	2019
Initial Opioid Patient**	361,449	296,325	262,195	295,995	282,232
IOP-HD Count (Percent)	124,831 (34.5)	90,478 (30.5)	86,144 (32.9)	77,990 (26.3)	63,800 (22.6)
IOP-LD Count (Percent)	73,446 (20.3)	53,270 (18.0)	46,510 (17.7)	47,806 (16.2)	32,599 (11.6)
IOP-LA Count (Percent)	3,548 (0.98)	1,973 (0.67)	1,461 (0.56)	1,579 (0.53)	1,532 (0.54)

**At least one opioid prescription, with no other opioid prescriptions in the preceding 90 days.

The Pharmacy Quality Alliance opioid measures are relatively new, and national benchmarks for all payers have not yet been established. However, PQA provided national estimates for Medicare and Medicaid against which we can compare some of our results (Table 3).

Additional comparison may be made with Pennsylvania Medicaid patients in 2014, where the rates for opioids at high dose (OHD), opioids from multiple providers (OMP), and concurrent opioids and benzodiazepines (COB) were 5.4%, 5.2% and 30.0% respectively.[4] Washington state OHD, OMP and OHDMP (multiple providers and high dose) rates were comparable to national averages. COB rates for Medicare patients were comparable to national rates, while COB rates for Medicaid patients were higher.

Table 3. Comparison of WA-APCD measures with national estimates provided by PQA

	WA-APCD		National	
	Medicaid (2014)	Medicare Fee-For-Service (2015)	Medicaid (2014)	Medicare Fee-For-Service (2015)
OHD Percent	2.4	6.4	4.2	6.1
OMP Percent	8.2	9.4	7.4	13.3
COB Percent	18.7	17.4	4.9	20.9 (2016)
OHDMP Percent	1.7 per 1000	2.1 per 1000	2.1 per 1000	6.5 per 1000

[4] Cochran, G, W. Lo-Ciganic, W. F. Gellad, A. J. Gordon, E. Cole, C. Lobo, W Frazier, P. Zheng, C. Chang, D. Kelly and J. Donohue. Prescription opioid quality measures applied among Pennsylvania Medicaid enrollees. *J Manag Care Spec Pharm*. 2018; 24(9):875-85.

Demographic Variation

Among established opioid users, concurrent opioids and benzodiazepines (COB) was higher among women than men. COB, high dose opioids (OHD), and opioids from multiple providers (OMP) were all higher among younger patients (age < 65). OHD and OMP were highest among Medicaid beneficiaries, while COB was highest for Medicare. Rates for high dose/multiple providers OMPHD were too low for meaningful comparisons. Among initial opioid users, high dose initial prescriptions (IOP-HD) was higher among younger (age < 65) male, and commercially insured patients. Long duration initial prescriptions (IOP-LD) was higher among female, older (age 65+) and Medicare patients. Long acting initial prescription (IOP-LA) rates are too low for meaningful comparisons to be made.

Table 4. PQA Opioid Measures in Washington State, 2019

	Established Opioid patients	OHD	OMP	COB
Total count (percent)	**118,571**	**2,524 (2.7)**	**2,213 (2.3)**	**10,805 (11.4)**
Female count (percent)	74,154	1,550 (2.6)	1,465 (2.5)	7,821 (13.2)
Male count (percent)	44,416	974 (2.7)	748 (2.1)	2,984 (8.4)
Age 18-64 count (percent)	70,477	1,987 (3.0)	1,922 (2.9)	7,966 (12.2)
Age 65+ count (percent)	48,094	537 (1.8)	291 (1.0)	2,839 (9.6)
Commercial count (percent)	46,257	985 (2.3)	980 (1.7)	4,648 (11.0)
Medicaid count Percent	18,872	600 (3.2)	782 (2.3)	2,083 (11.1)
Medicare count (percent)	53,442	939 (2.8)	451 (1.2)	4,074 (12.0)

	Initial Opioid patients	IOP-HD	IOP-LD	IOP-LA
Total count (percent)	**282,232**	**63,800 (22.6)**	**32,599 (11.6)**	**1,532 (0.5)**
Female count (percent)	166,405	37,070 (22.3)	20,290 (12.2)	896 (0.5)
Male count (percent)	115,794	26,718 (23.1)	12,305 (10.6)	635 (0.5)
Age 18-64 count (percent)	203,904	47,631 (23.4)	18,668 (9.2)	882 (0.4)
Age 65+ count (percent)	78,326	16,169 (20.6)	13,931 (17.8)	650 (0.8)
Commercial count (percent)	103,985	24,873 (23.9)	8,351 (8.0)	321 (0.3)
Medicaid count Percent	97,105	21,503 (22.1)	10,334 (10.6)	447 (0.5)
Medicare count (percent)	56,505	12,851 (22.7)	9,925 (17.6)	537 (1.0)

Geographic Variation

Figures 1-5 display PQA opioid measures by Washington state legislative district in 2018. Rates for all measures varied considerably, though few obvious spatial patterns can be seen for these measures. IOP-LD was lower in the Puget Sound area than in the rest of the state, and OMP rates (Figure 5) are lowest in sparsely populated rural areas where there are fewer providers and pharmacies. OMPHD and IOP-LA rates were too low to be reliably estimated by legislative district. Larger images of these maps with district numbers labeled are provided in the appendix.

Figure 1. OHD by Legislative District in Washington State, 2018

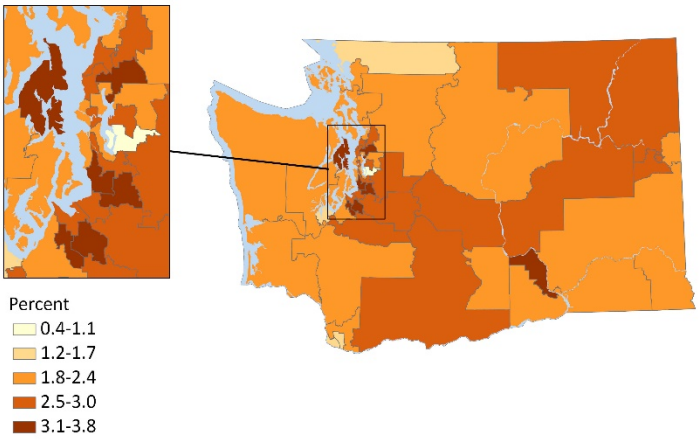


Figure 2. OMP by Legislative District in Washington State, 2018

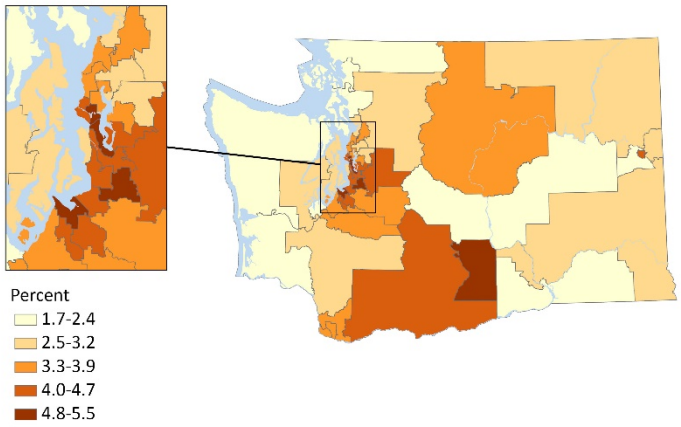


Figure 3. COB by Legislative District in Washington State, 2018

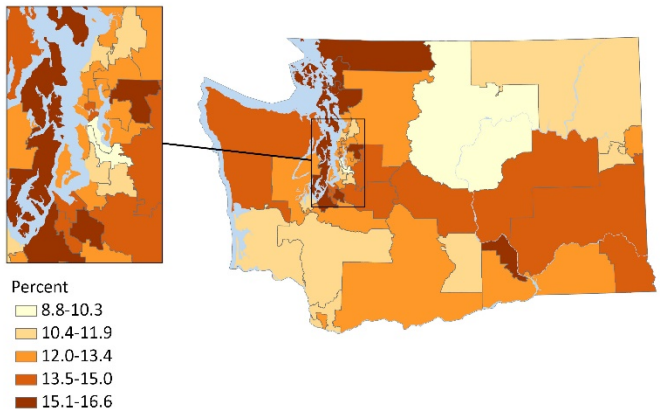


Figure 4. IOP-HD by Legislative District in Washington State, 2018

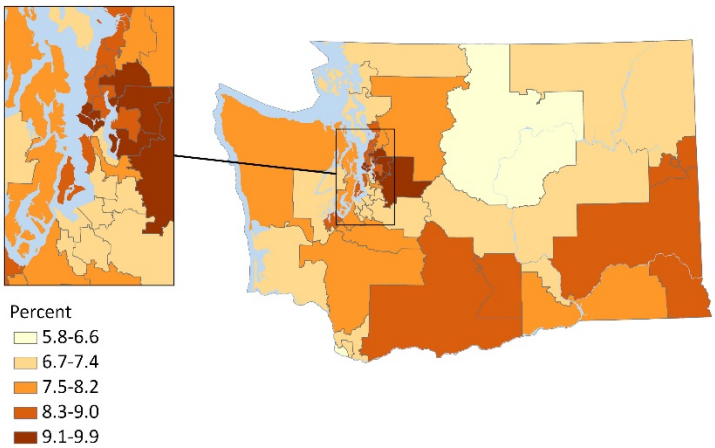
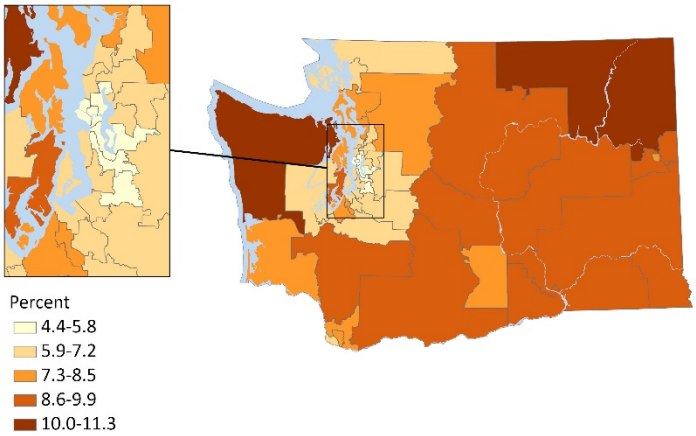


Figure 5. IOP-LD by Legislative District in Washington State, 2018

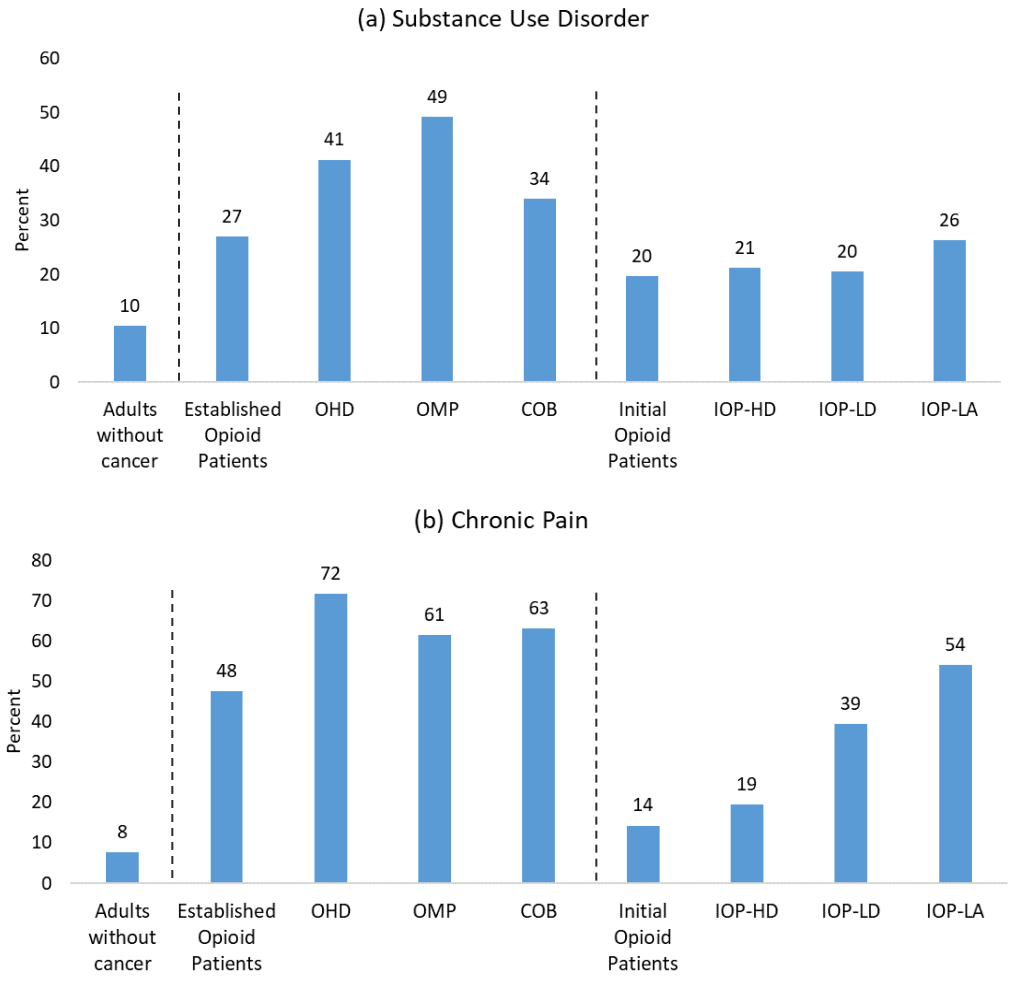


Health Status

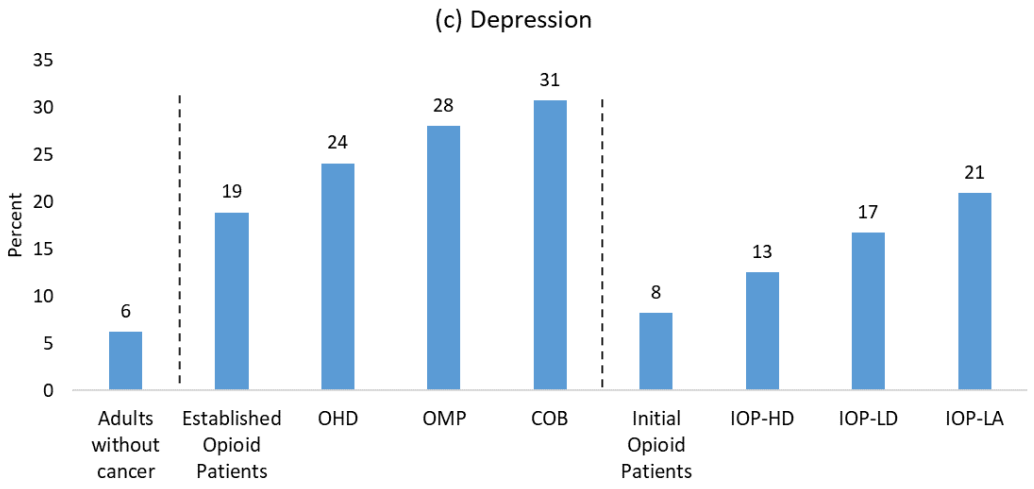
We examined the prevalence of five health conditions among adults without cancer by opioid status. We used the Center for Medicare and Medicaid Services Chronic Conditions Warehouse definitions[5] to identify members with depression and those with multiple chronic conditions. Substance use disorder, anxiety and chronic pain were defined using International Classification of Diseases, Tenth Revision (ICD 10) diagnosis codes (see Appendix, Table 1).

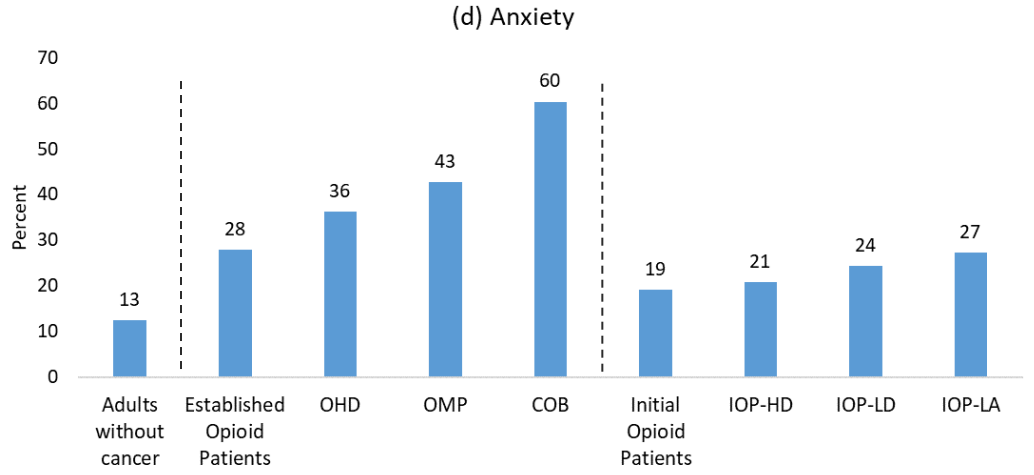
In all cases, the prevalence of poor health outcomes was higher among opioid patients than non-opioid patients, higher among established opioid patients than initial opioid patients and higher still among high-risk opioid patients (Figure 6). Patterns in health status remained consistent after controlling for age, sex and Medicaid status (Appendix, Table 2).

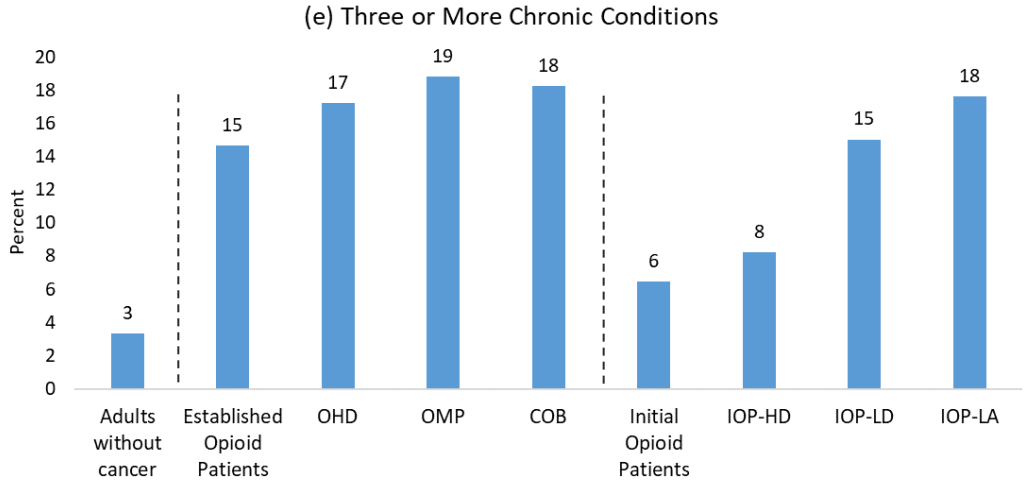
Figure 6. Prevalence of Selected Health Conditions by Opioid Status in Washington State, 2017



[5] Center for Medicare and Medicaid Services, Chronic Conditions Data warehouse. https://www.ccwdata.org/web/guest/condition-categories Accessed Jun 5, 2019


(c) Depression
Percent
35
30
25
20
15
10
5
0
6
19
24
28
31
8
13
17
21
Adults without cancer
Established Opioid Patients
OHD
OMP
COB
Initial Opioid Patients
IOP-HD
IOP-LD
IOP-LA

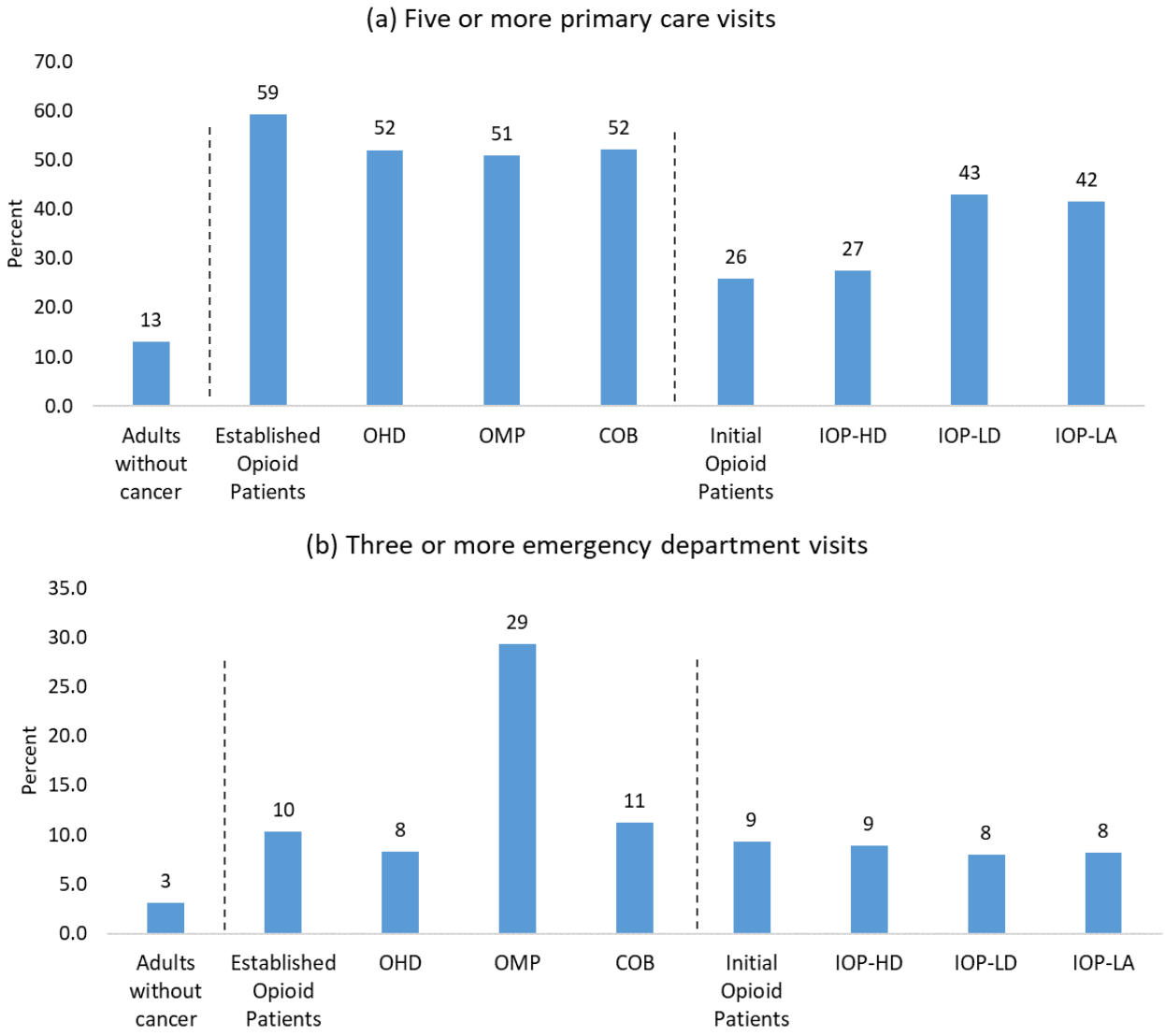

(d) Anxiety
Percent
70
60
50
40
30
20
10
0
13
28
36
43
60
19
21
24
27
Adults without cancer
Established Opioid Patients
OHD
OMP
COB
Initial Opioid Patients
IOP-HD
IOP-LD
IOP-LA

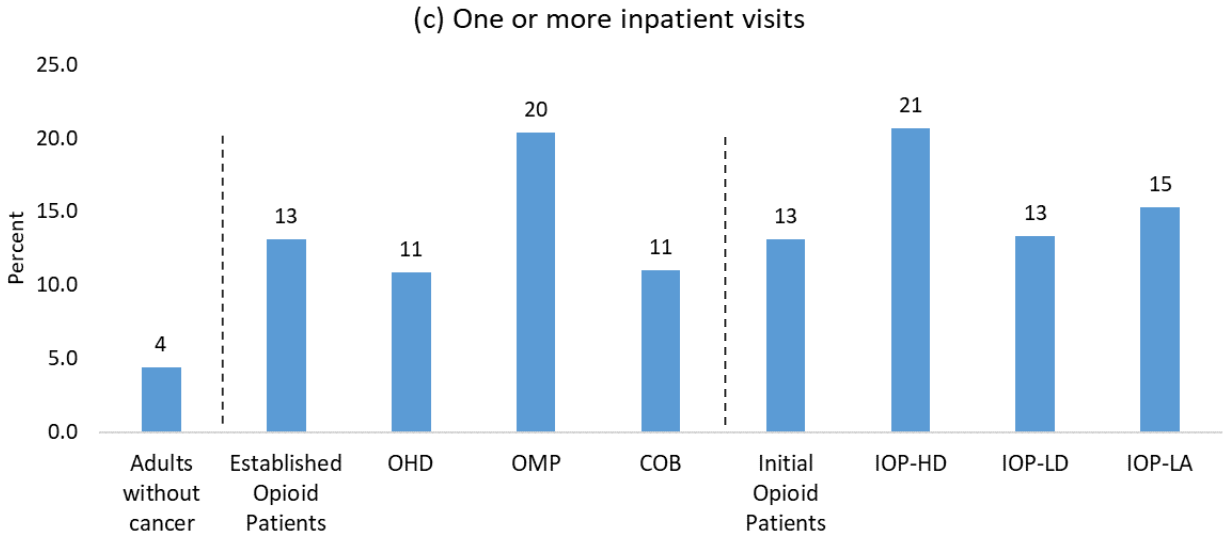

(e) Three or More Chronic Conditions
Percent
20
18
16
14
12
10
8
6
4
2
0
3
15
17
19
18
6
8
15
18
Adults without cancer
Established Opioid Patients
OHD
OMP
COB
Initial Opioid Patients
IOP-HD
IOP-LD
IOP-LA

Health Care Utilization

Medical care utilization was measured as the number of primary care visits (five or more), emergency department visits (three or more) and inpatient discharges (one or more) that occurred during the year (Figure 7). Pharmacy utilization was measured as the number of distinct prescription drug products (10 or more) received during the year (Figure 8). Distinct drug products were determined using Food and Drug Administration drug proprietary names.

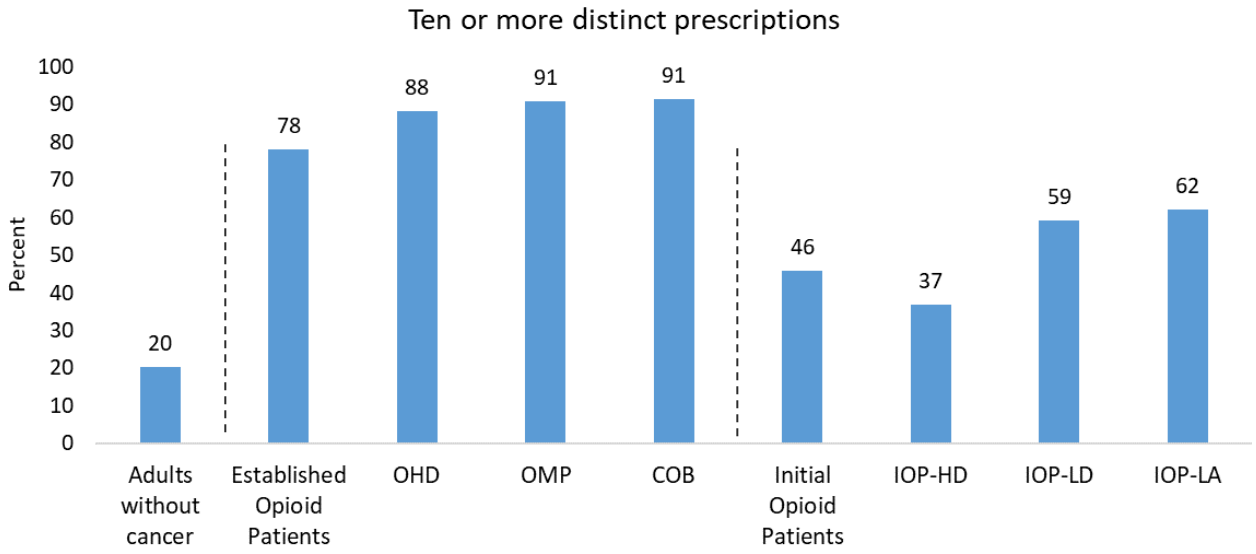
Figure 7. Health care utilization by opioid status in Washington State, 2018





Primary care utilization was higher among all opioid use categories compared to adults without cancer, and higher among established opioid patients than initial opioid patients. Emergency department and inpatient utilization was higher among all opioid use categories. Opioids from multiple provider (OMP) patients were substantially more likely to have had multiple ED visits than any other group. OMP and IOP-HD patients were most likely to have had inpatient stays. Patients with inpatient stays or multiple ED visits are likely to encounter and potentially receive prescriptions from many distinct providers. Coordination of care for these patients could be challenging.

Figure 8. Polypharmacy – 10 or more Distinct Prescription Products during the Year by Opioid Status in Washington State, 2018

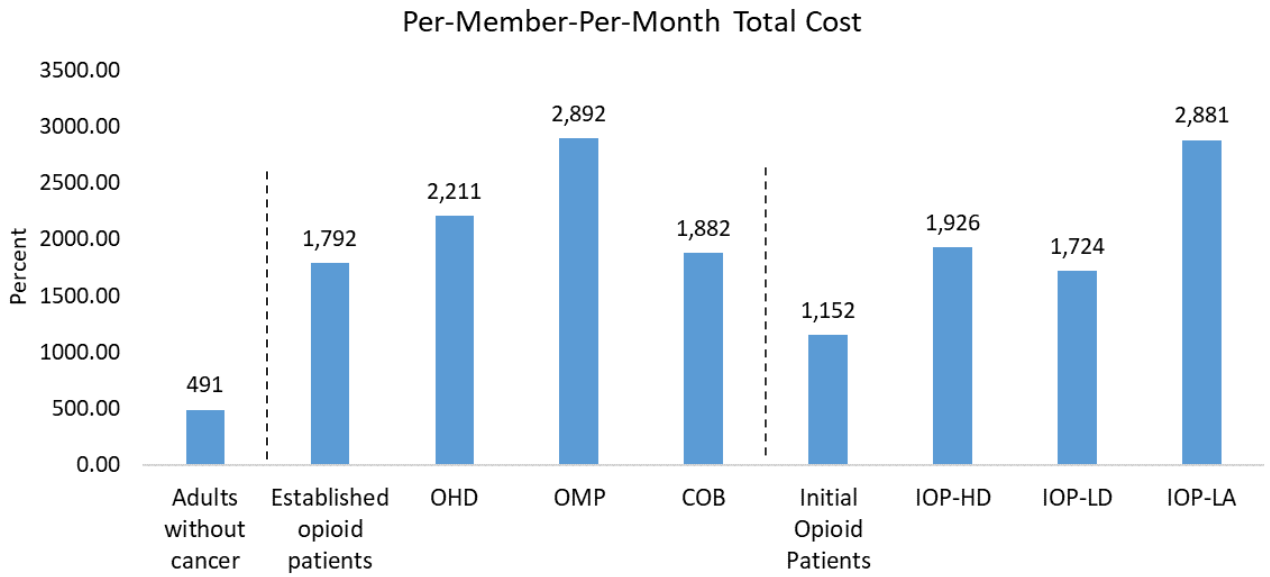


Polypharmacy – defined here as 10 or more distinct prescription drug products in a year (Figure 8) – was common among established opioid patients (78%) and predominant among opioid at high dose (OHD, 88%), opioid from multiple provider (OMP, 91%) and concurrent opioid and benzodiazepine (COB, 91%) patients. Many opioid patients experience multiple comorbid health conditions (Figure 6). Careful monitoring by the patient's pharmacist and primary care provider would be necessary to avoid adverse effects. Such coordination of care may be particularly difficult to achieve among OMP patients. Patterns in medical and pharmacy utilization remained consistent after controlling for age, sex and Medicaid status (Appendix, Table 2).

Cost

Cost (Figure 9) was measured as the insurance paid amount for all medical and pharmacy claims for the year, expressed in terms of average cost per-member-per-month (PMPM). Cost was highest ($2,892 PMPM) for opioids from multiple providers (OMP) patients, who also had the highest level of inpatient and emergency department utilization (Figure 7), Cost was also high ($2,881 PMPM) among long acting initial opioid patients (IOP-LA), though these patients were rare (0.53% of initial opioid patients).

Figure 9. Total Medical and Pharmacy, Per-Member-Per-Month Insurance Paid Amount by Opioid Status in Washington State, 2018



Discussion

The Pharmacy Quality Alliance opioid prescribing measures were designed to identify segments of the opioid patient population who are at higher risk for adverse outcomes such as overdose or dependency. Higher dosages, patients shopping from multiple sources and interactions with other drugs, particularly benzodiazepine sedatives, are all recognized indicators of overdose risk.[6,7] Indeed, opioids at high dose (OHD) and opioids from multiple provider (OMP) patients had 2.7 times higher odds of overdose and concurrent opioids and benzodiazepines (COB) patients had 2.3 times higher odds of overdose compared to other opioid patients (Appendix, Table 2). Substance use disorder was also seen with higher prevalence among these high-risk groups, particularly OMP.

The OMP population presents significant challenges. These patients are receiving opioid prescriptions from multiple sources, indicating a lack of coordination among providers. The high rate of diagnosed substance use disorder (49%) in this group suggests that many may indeed have been "doctor shopping" for opioids, and so actively resisting coordination of care. High utilization among this group suggests two possibilities. High primary care and emergency department utilization is consistent with the idea of doctor shopping. However, the high percent with multiple inpatient stays may also represent a distinct sub-population where complex treatment needs has led to dis-coordinated care. The Washington State Prescription Monitoring Program (PMP)[8] tracks dispensing records for schedule II, III, IV and V drugs in Washington state. Providers and pharmacists should consult the PMP before prescribing or dispensing opioids.

The high prevalence of chronic pain (72%) among OHD patients suggests that many in this group were in legitimate need of relief. However, the high prevalence of diagnosed substance use disorder (41%) shows that desired pain relief can come with a cost. These patients highlight the need for caution and flexibility in designing policies aimed at reducing opioid use. For them, a rigid policy suddenly restricting their opioid prescriptions, without simultaneously providing addiction treatment options, could result in unmanageable pain compounded by withdrawal symptoms.[1] In such circumstances, some may turn to illicit sources. Others may become shoppers.

The COB population exhibited both a high prevalence of chronic pain (60%) and a high prevalence of anxiety (61%) suggesting that many may have legitimate need for both treatments. However, research indicates that, among opioid abusers' benzodiazepines are generally used recreationally to enhance the opioid high.[9] Given the increased risk of overdose when opioids and benzodiazepines are combined, extremely careful management by the patient's primary care provider is essential.

The initial opioid prescribing (IOP) measures monitor prescribing guidelines intended to reduce the risk of opioid naïve patients becoming dependent – specifically, to avoid initially prescribing high dose (IOP-HD), long duration (IOP-LD) or long acting (IOP-LA) opioids. Among IOP-HD patients, 21% had at least one inpatient stay during the year, suggesting that some high dose prescriptions may have been related to painful surgical procedures. Additional analyses to identify specific procedures and settings in which high risk prescriptions are given may be informative. Long duration (IOP-LD) initial prescriptions seem to be related to patients with complex medical needs. IOP-LD patients had high prevalence of polypharmacy, multiple chronic conditions, and five or more primary care visits in a year. IOP-LA was quite rare, but seems to

[6] Nabarun, D, J. J. Funk, S. Proescholdbell, A. Hirshc, K. M. Ribisl, and S. Marshall. Cohort study of the impact of high dose opioid analgesics on overdose mortality. *Pain Medicine* 2016; 17:85-98.
[7] Baumblatt, J. A., C. Wiedemann, J. R. Dunn, W. Schaffner, L. J. Paulozzi, and T. F. Jones. High-risk use by patients prescribed opioids for pain and its role in overdose deaths. *JAMA Intern Med.* 2014;174(5):796-801.
[8] Washington State Department of Health Prescription Monitoring Program. P.O. Box 47852, Olympia WA 98504-7852, 360-236-2901. https://www.doh.wa.gov/ForPublicHealthandHealthcareProviders/HealthcareProfessionsandFacilities/PrescriptionMonitoringProgramPMP
[9] Jones, J.D. S. Mogali, and S. D. Comer. Polydrug abuse: A review of opioid and benzodiazepine combination use. *Drug Alcohol Depend.* 2012, 125(1-2): 8-18.

follow a similar pattern to IOP-LD. All three IOP measures decreased substantially from 2015 – 2019, perhaps reflecting increased vigilance among prescribers and clear guidelines from the Centers for Disease Control.

Limitations

A key limitation of this study is the absence of Medicare fee-for-service data for 2018 and 2019, and the incomplete representation of commercial plans in all years. The study population therefore over-represents the Medicaid population in all years. The Medicare population would be underrepresented in 2018 and 2019, and overrepresented in 2014-2017. To avoid confounded opioid trends with shifting demographic representation in the database, Medicare Fee-for-service clients were excluded in all years. No information was available regarding drug rebates, which would lead to overestimation of total cost. Claims data are primarily used for billing purposes, and so may not reflect the patient's full medical status or health history. For example, though a diagnosis code exists for chronic pain, there may be other diagnoses by which a provider may be reimbursed (e.g. arthritis) and so the code may not be universally applied. Prevalence of diagnosis codes in claims data may sometimes reflect billing practices among providers, partially obscuring the health status of the underlying population.

Appendix

Methods

The Washington All-Payer Claims Database contains pharmacy and medical claims to Washington state insurers from 2014 through 2019. In 2018, 66% of Washington state covered lives were included in the database (All Medicaid, 80% of Medicare Advantage and 53% of commercial payer covered lives). At the time of analysis, Veterans Administration and out of state plans were not included, and Medicare Fee-For Service was available only for 2014-2017. Washington State Public Employee Benefits Board claims are included, but other self-insured plans are not.

Opioid prescribing measures were produced for each year using the proprietary methodology provided by the Pharmacy Quality Alliance (PQA). The eligible population included WA-APCD members age 18 or older residing in Washington state, having at least 11 months of prescription drug coverage. Members with a cancer diagnosis, sickle cell anemia diagnosis, or hospice indicator during the measurement year were excluded. The denominator for opioids at high dose (OHD), opioids from multiple providers (OMP) and concurrent opioids and benzodiazepines (COB) included eligible members with two or more opioid prescriptions on distinct dates during the reference year for a cumulative supply of 15 days or more. For brevity, this population is referred to simply as "established opioid patients," and the eligible population are referred to as "adults without cancer." The denominator population for initial opioid prescribing measures (IOP) included eligible members with at least one initial opioid prescription in the measure year. An initial opioid prescription was one with no prior opioid prescriptions in the preceding 90 days. For brevity, this population was referred to as "initial opioid patients."

Concurrent opioids and benzodiazepines (COB) members were identified as having two or more benzodiazepine claims on distinct dates, with 30 or more cumulative days of concurrent use of opioids and benzodiazepine. Opioids at high dose (OHD) members were those with a cumulative daily dosage of 120 morphine milligram equivalents (MME) or more for 90 or more days during the reference year. Opioids from multiple providers (OMP) members received opioid prescriptions from four or more distinct prescribers and from four or more distinct pharmacies. Opioids at high dose from multiple providers (OMPHD) satisfied the criteria for both OHD and OMP.

High dose initial opioid prescriptions (IOP-HD) were initial prescriptions with a cumulative daily dose of 50 MME or more. Long duration initial opioid prescriptions (IOP-LD) were initial prescription for a cumulative supply of more than 7 days. Long-acting initial opioid prescriptions (IOP-LA) were initial prescriptions for a long acting opioid formulation. National drug classification codes (NDC) for long-acting opioids were provided by PQA.

Statewide rates for OHD, OMP, COB, and OMPHD were produced for years 2014 through 2019. Because the IOP measures required a 90-day lookback period, these could be produced only from 2015-2019. Local rates by legislative district and measures by age, sex, and primary payer were produced for 2018 for all measures except OMPHD. We examined associations with health status, health care utilization, and health care spending in 2018 for all measures except OMPHD.

Table 1. ICD10 Codes Used to Define Selected Health Conditions

	International Classification of Diseases, Tenth Revision (ICD10) codes
Substance use disorder	F1
Overdose	T400, T401, T402, T403, T404, T406
Anxiety	F40, F41
Chronic pain	G892, G894

Table 2. Logistic Regression Odds-Ratios for Health Status and Health Care Utilization with Opioid Status Controlling for Age, Sex and Medicaid Status, 2017

	Odds ratio [95 percent CI]			
	Opioid patient*	OHD**	OMP**	COB**
Substance use disorder diagnosis	3.89 [3.83-3.94]	1.95 [1.81-2.10]	2.32 [2.19-2.45]	1.40 [1.35-14.5]
Overdose diagnosis	5.86 [5.46-6.28]	2.70 [2.15-3.35]	2.71 [2.29-3.20]	2.31 [2.03-2.61]
Chronic pain diagnosis	12.4 [12.3-12.6]	3.51 [3.16-3.92]	1.85 [1.75-1.65]	2.01 [1.95-2.08]
Anxiety diagnosis	1.66 [1.63-1.68]	1.57 [1.46-1.69]	1.79 [1.70-1.89]	5.43 [5.25-5.62]
Depression diagnosis	3.71 [3.65-3.77]	1.29 [1.18-1.41]	1.75 [1.65-1.86]	1.96 [1.88-2.03]
3 or more chronic conditions	4.37 [4.29-4.46]	1.37 [1.24-1.50]	1.89 [1.75-1.95]	1.29 [1.23-1.35]
1 or more ED visits	2.83 [2.80-2.87]	0.74 [0.68-0.80]	2.51 [2.38-2.65]	0.89 [0.86-0.92]
3 or more ED visits	5.09 [4.97-5.22]	0.71 [0.60-0.82]	3.89 [3.65-4.15]	0.89 [0.84-0.95]
1 or more inpatient stay	3.93 [3.86-4.00]	0.86 [0.78-0.96]	2.41 [2.26-2.55]	0.82 [0.79-0.86]
3 or more inpatient stays	8.19 [7.70-8.72]	1.53 [1.20-1.92]	3.95 [3.46-4.50]	1.04 [0.91-1.18]
1 or more primary care visit	2.72 [2.68-2.76]	0.79 [0.73-0.87]	1.06 [0.99-1.14]	1.04 [0.99-1.08]
5 or more primary care visits	5.80 [5.73-5.87]	1.40 [1.30-1.50]	1.57 [1.49-1.65]	1.38 [1.34-1.43]
10 or more distinct prescription medications	13.4 [13.3-13.6]	1.88 [1.59-2.21]	13.2 [12.2-14.3]	2.13 [1.96-2.31]

*Opioid patients vs. non-opioid patients among adults without cancer.
**OHD (OMP, COB) vs. non-OHD (OMP, COB) among opioid patients.

Figure 1. OHD by Legislative District in Washington State, 2018

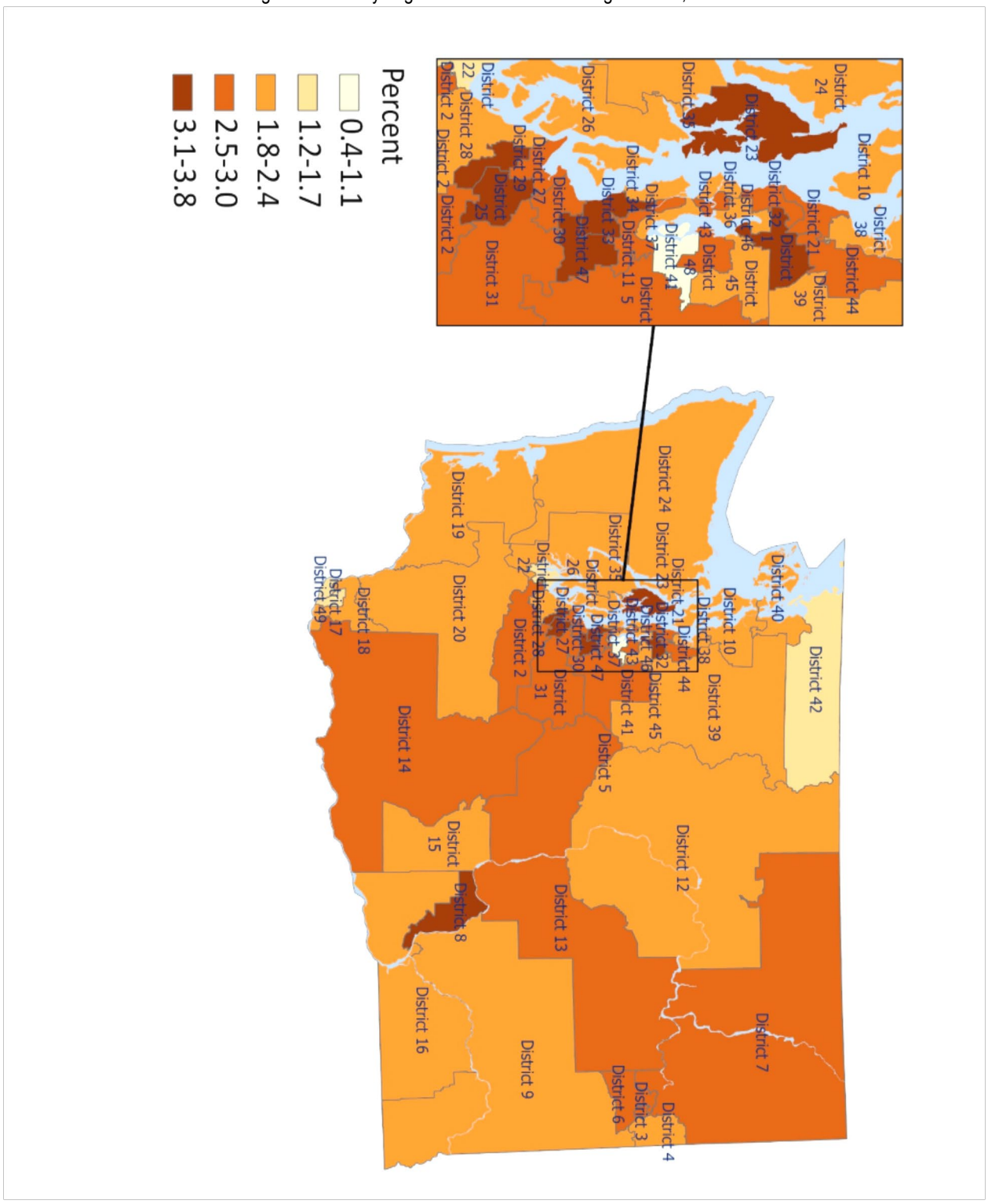


Figure 2. OMP by Legislative District in Washington State, 2018

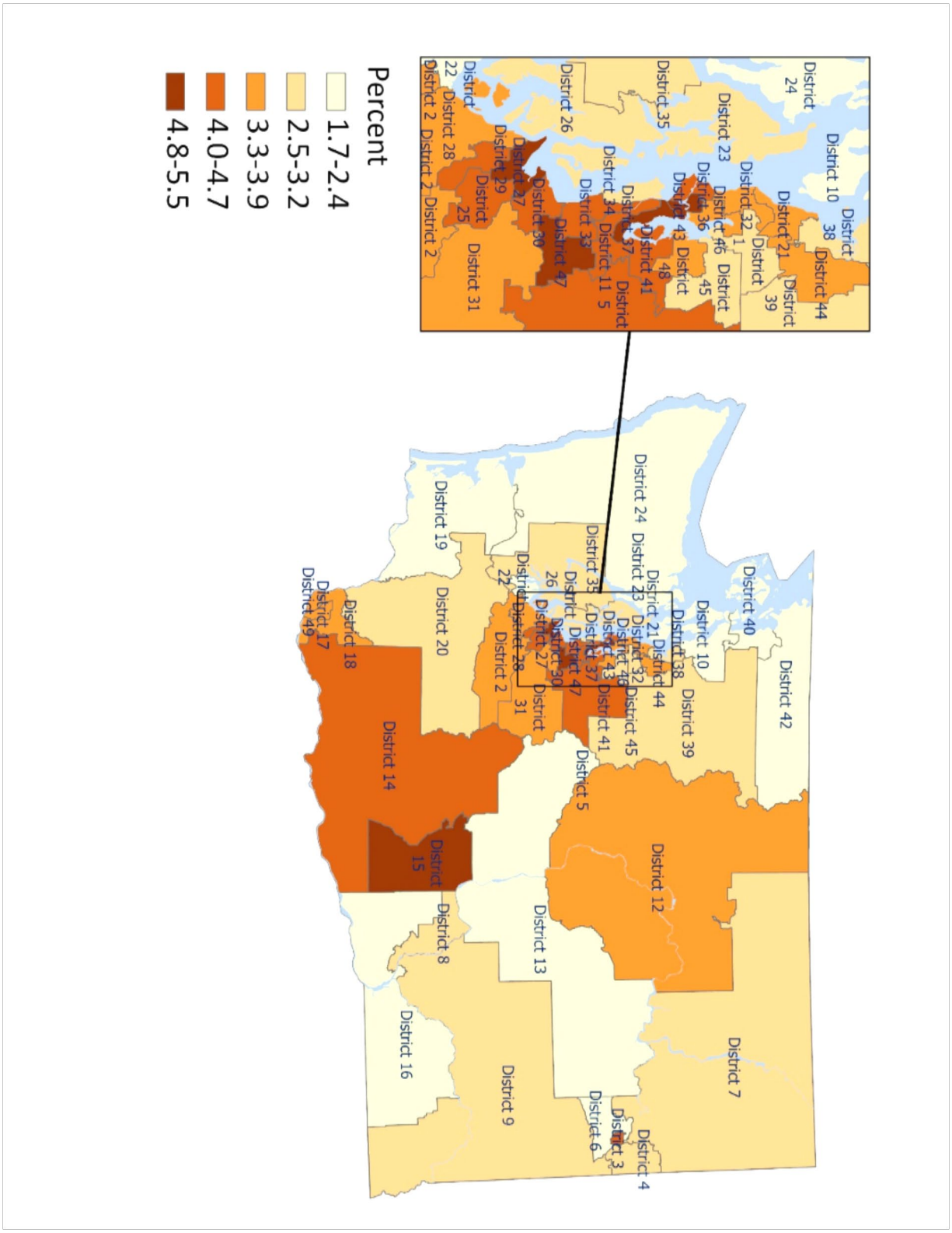


Figure 3. COB by Legislative District in Washington State, 2018

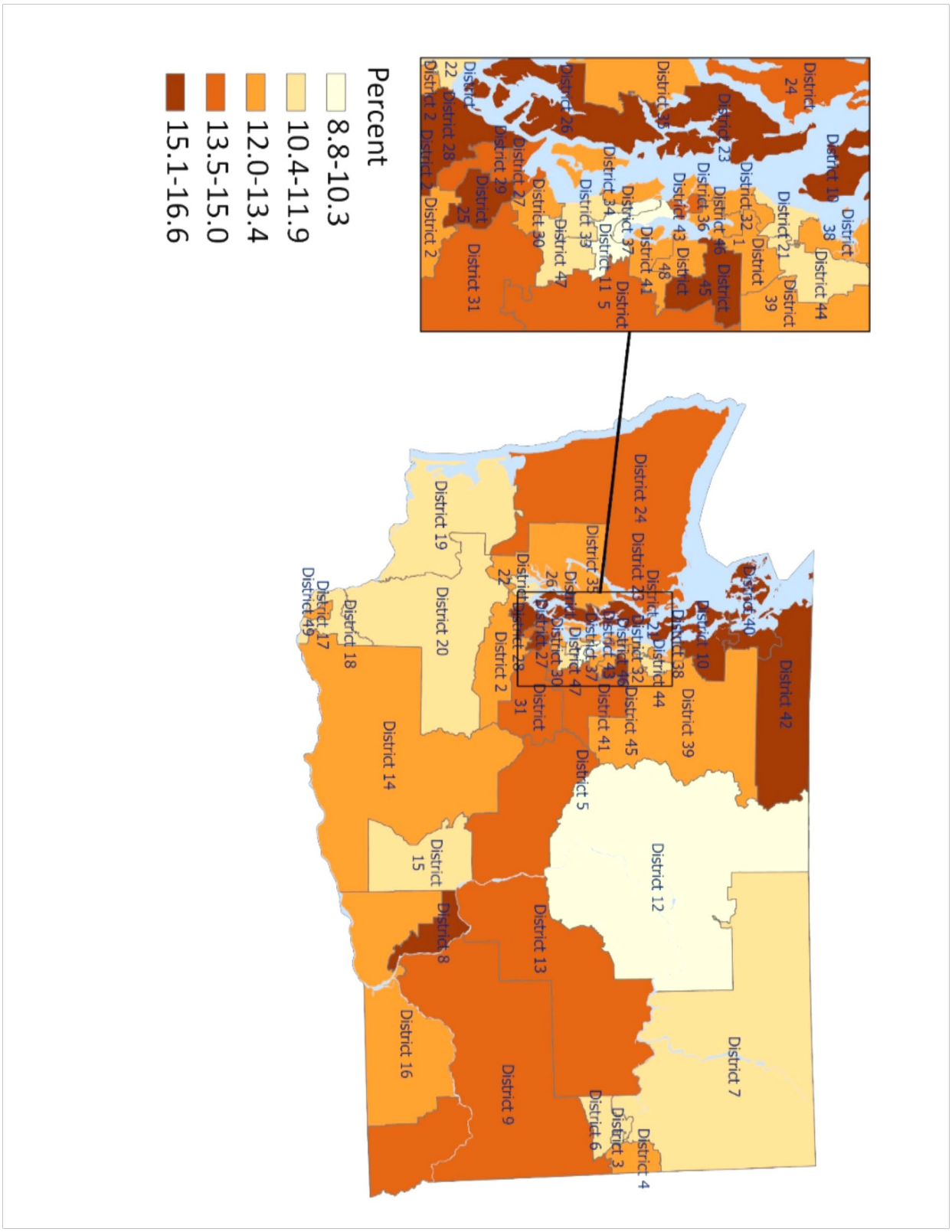


Figure 4. IOP-HD by Legislative District in Washington State, 2018

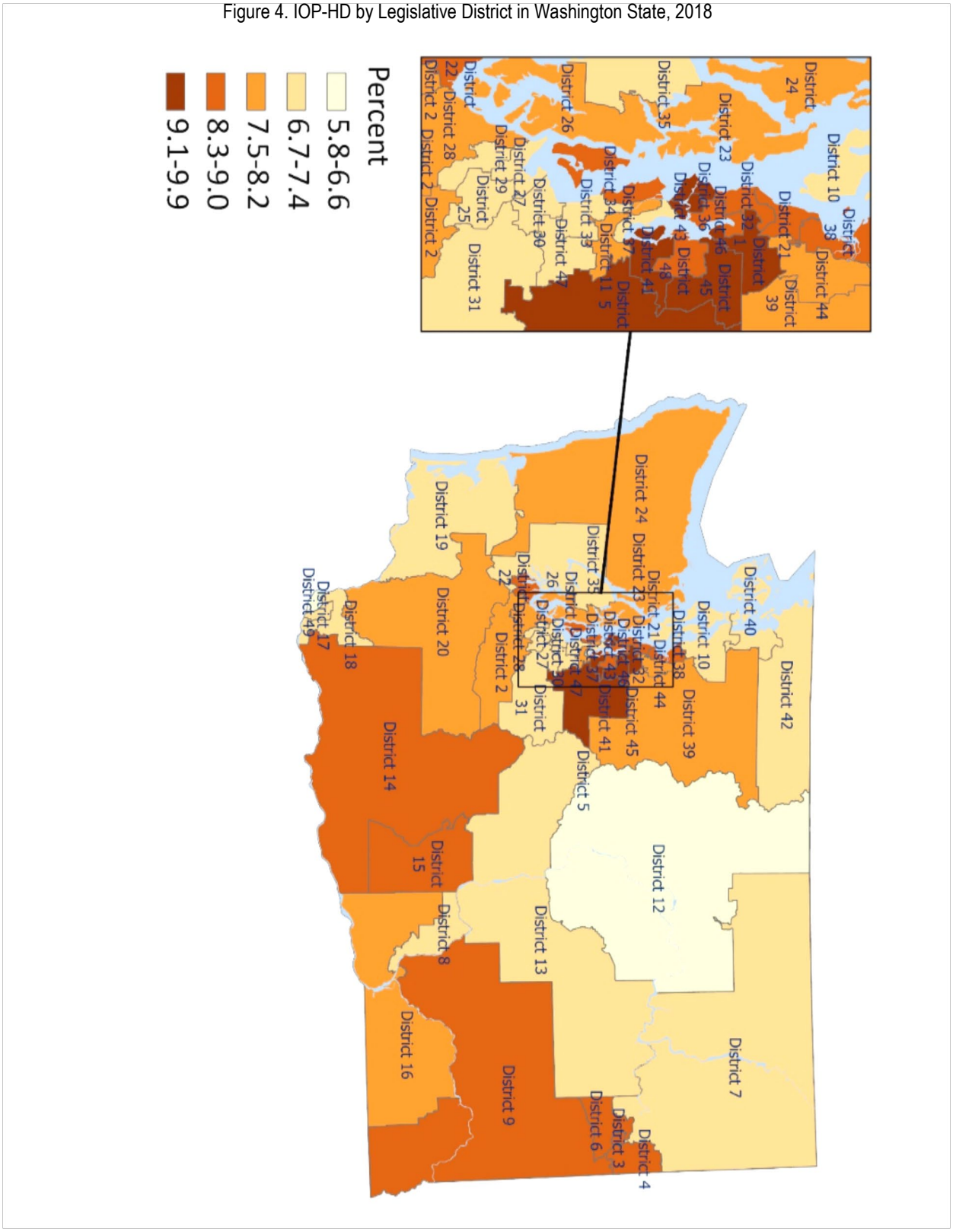
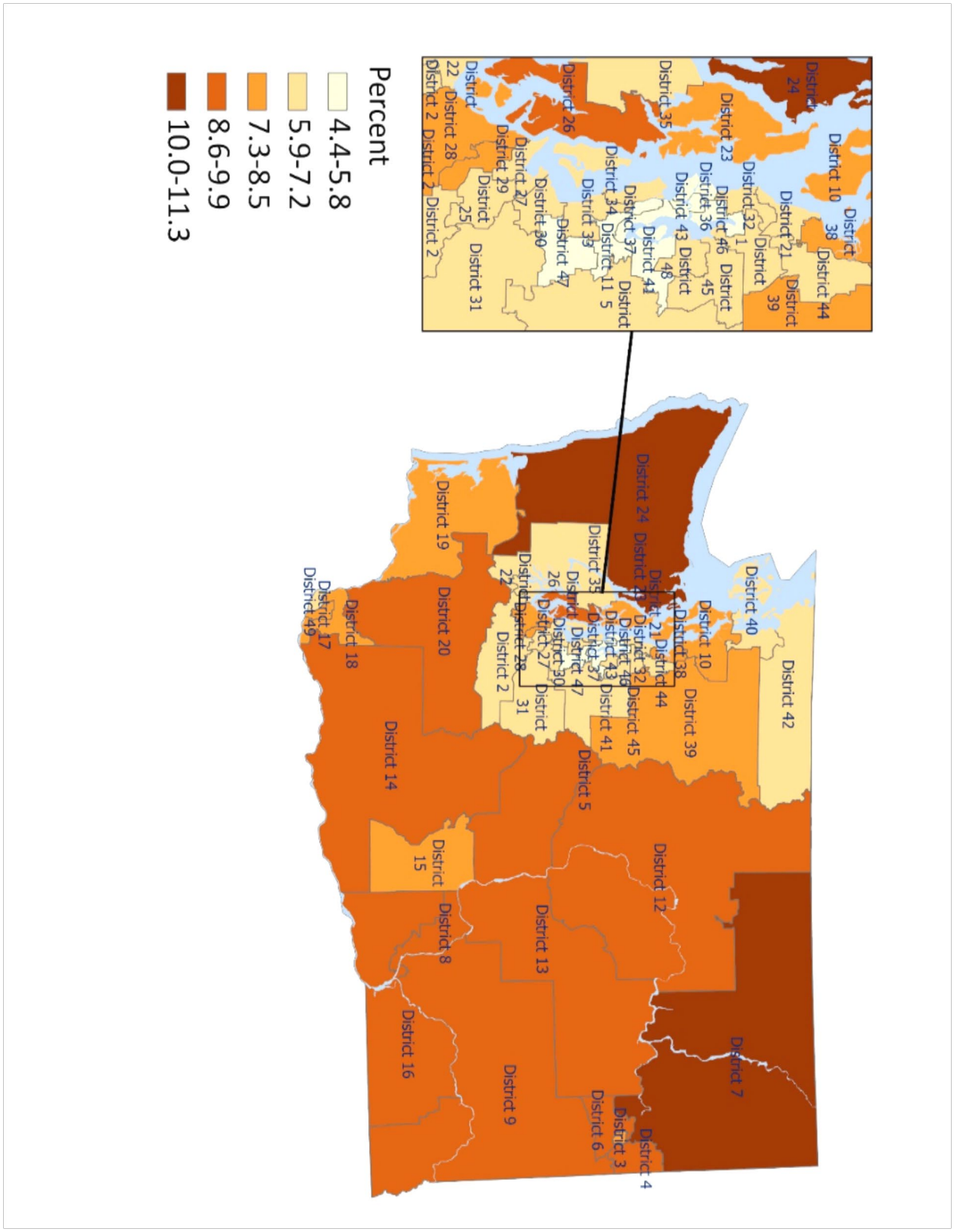



Figure 5. IOP-LD by Legislative District in Washington State, 2018