



Lister Hill National Center for  
Biomedical Communications

# Opioid Use and Misuse in the American Elderly Population

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# Our Medicare data

20% random sample of Part D enrollees from 2006 to 2015.

- 11.2 million patients (beneficiaries), 2.3 billion prescriptions (claims).

Beneficiary (patient) eligibility for this study: *Full enrollment in Medicare Parts A/B/D, zero Part C.*

- **4.9 million beneficiaries**
- **1 billion prescriptions**

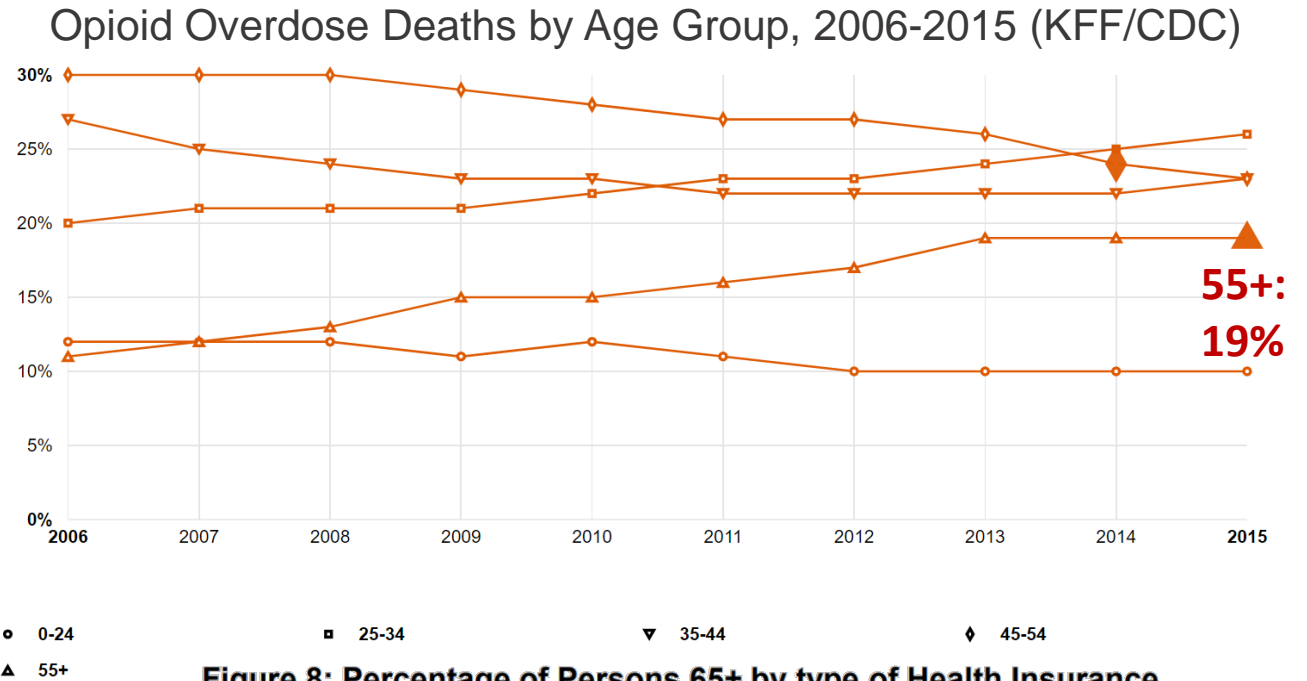
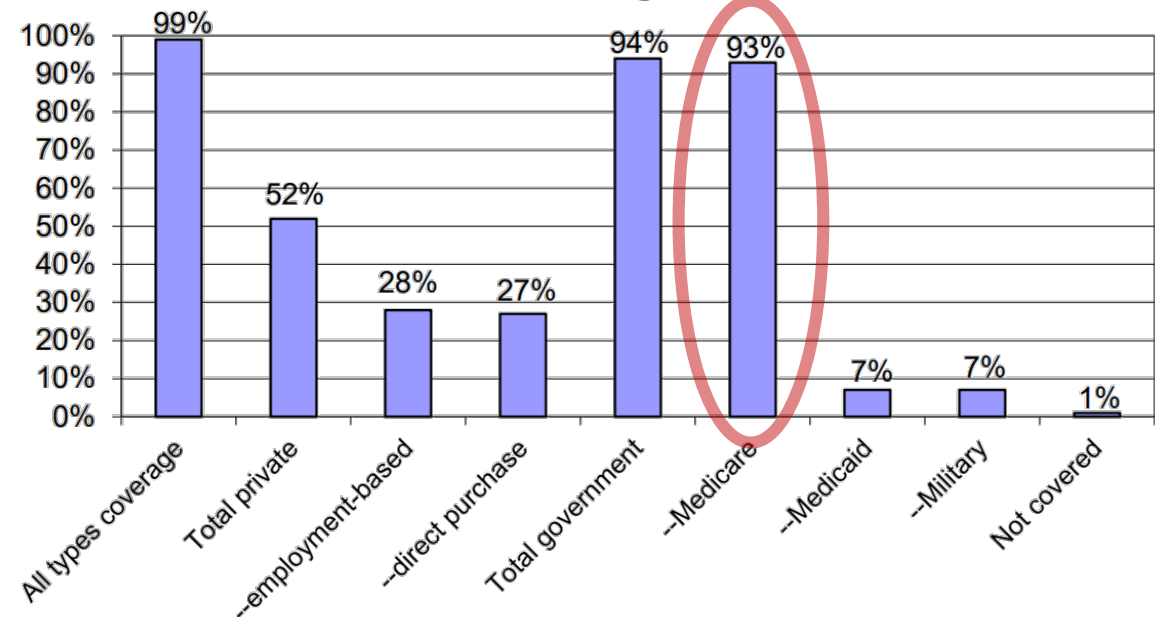



Figure 8: Percentage of Persons 65+ by type of Health Insurance Coverage, 2015



**Drugs:** NDC → RxNorm → Anatomical-Therapeutic-Chemical classes.




previous work, code available at  
[github.com/fabkury/ndc\\_map](https://github.com/fabkury/ndc_map)

Cancer pain

Opioid Use Disorder

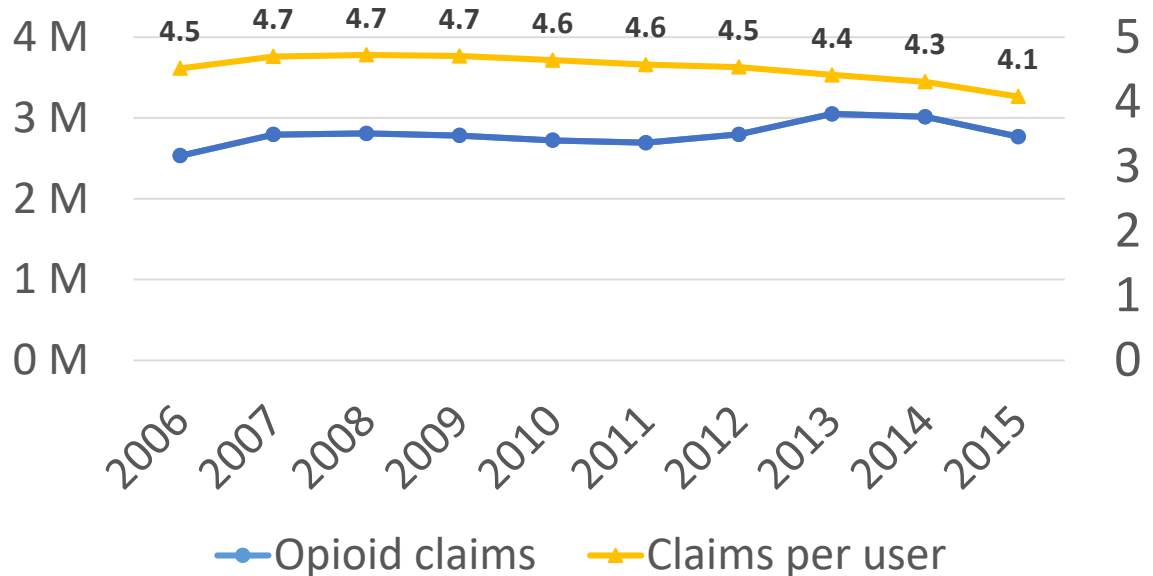
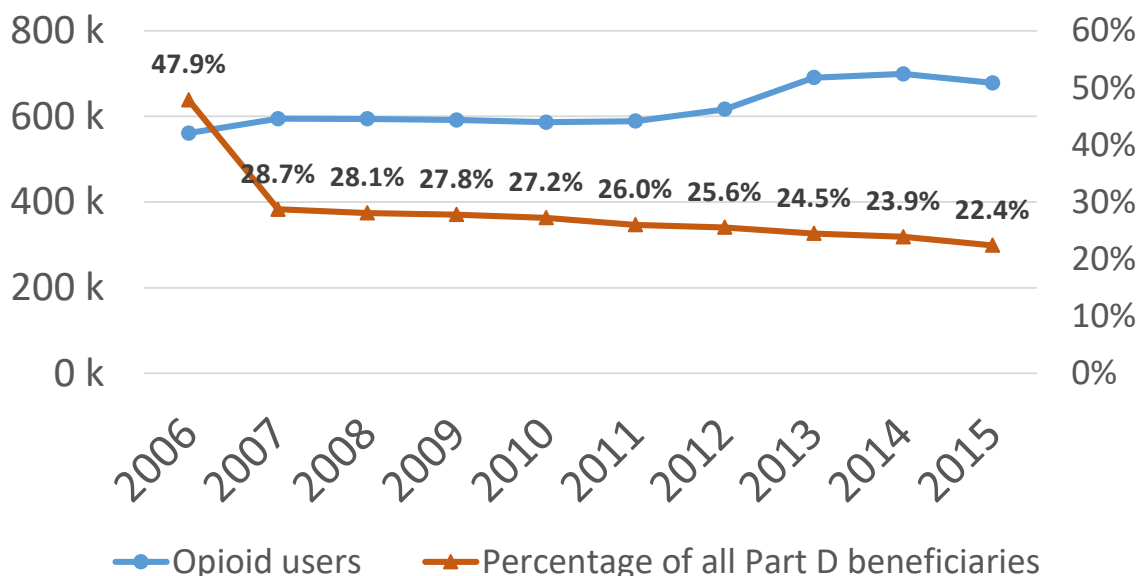
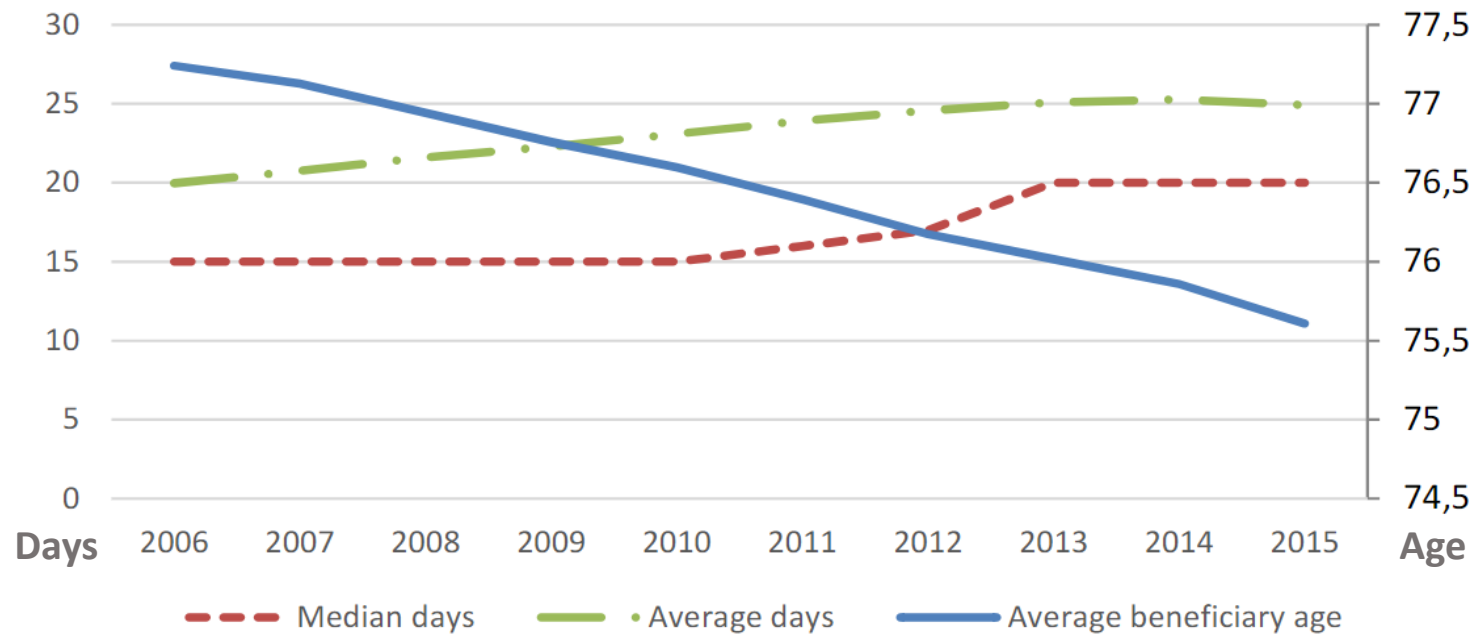
Overdose



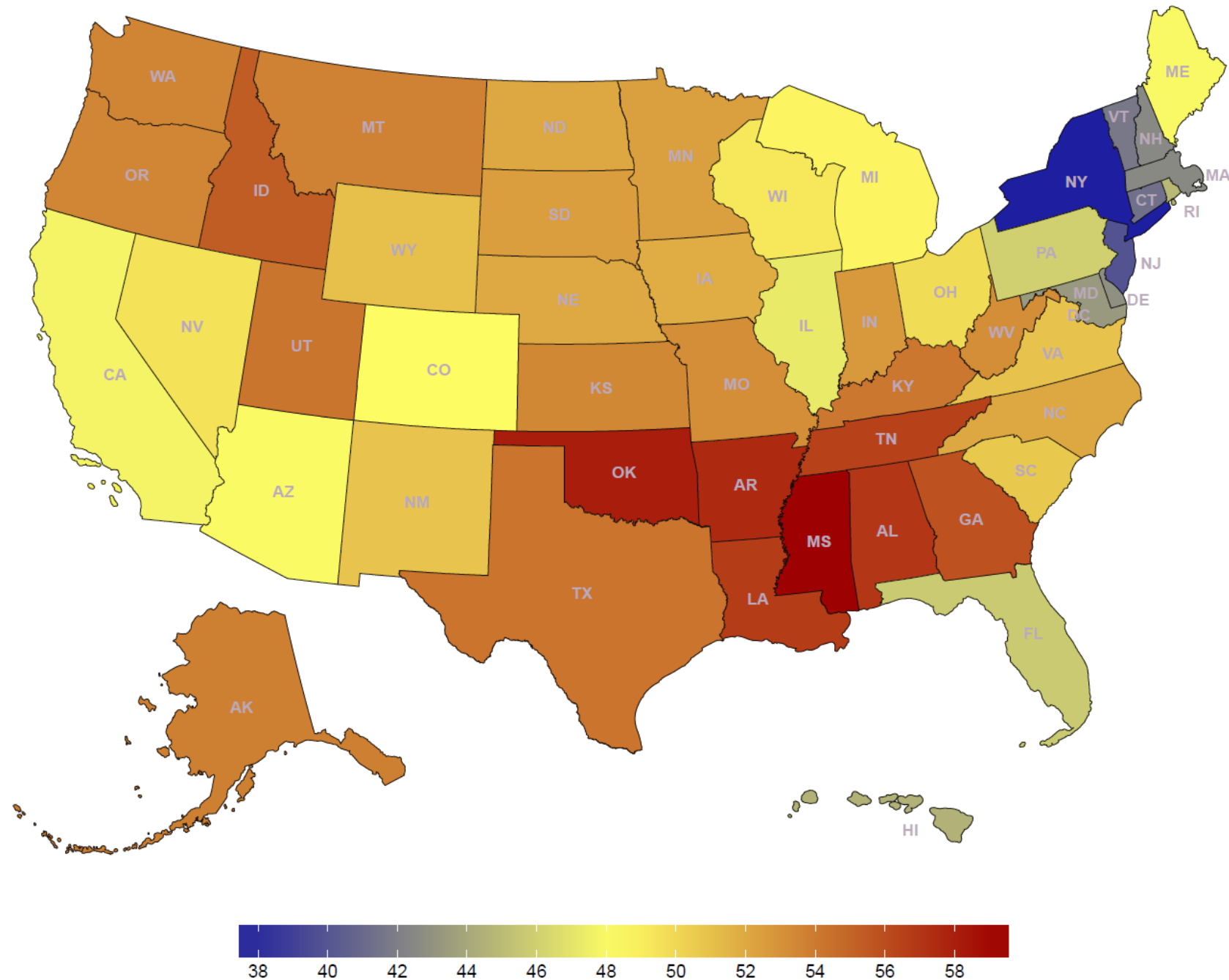
ICD-9/10 and  
Revenue Center  
codes

**Outliers:** acceptable is [lowest strength \* 1/4, highest strength \* 18].

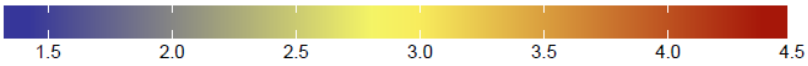
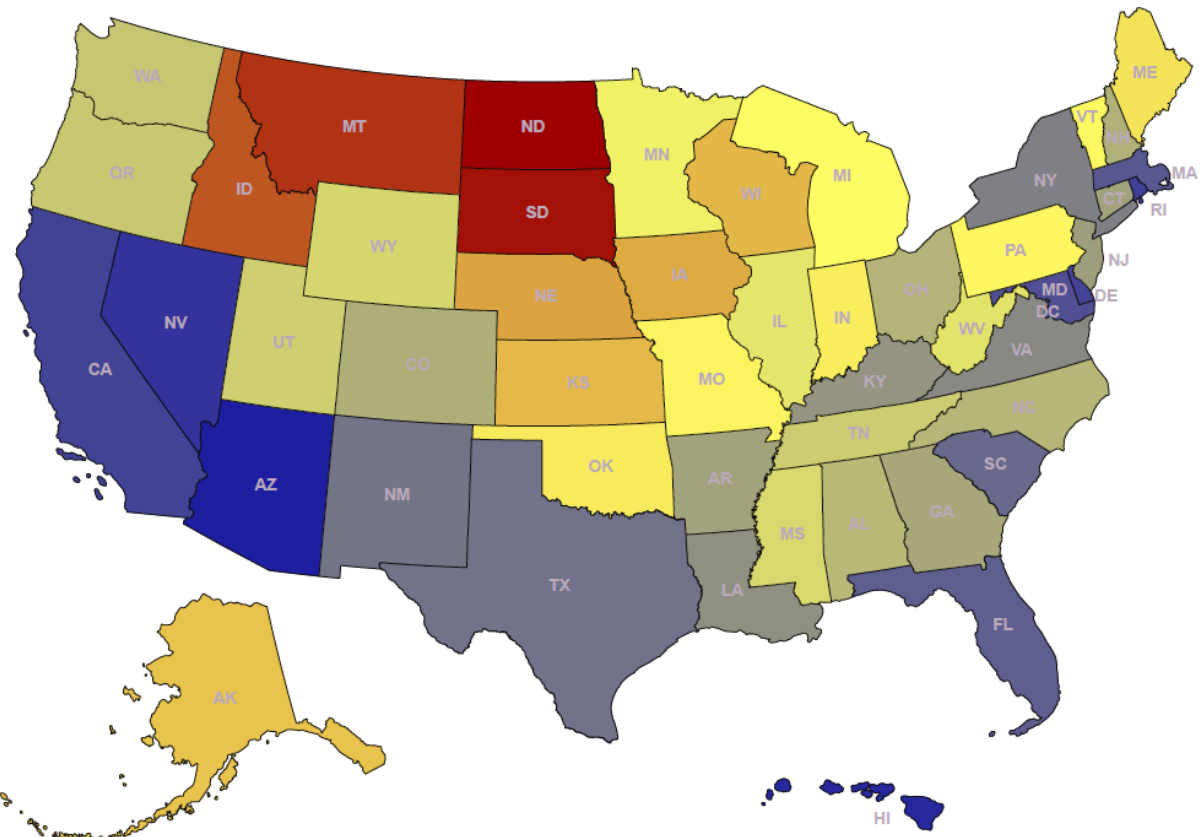
# Opioid users and prescriptions in Medicare Part D, 2006-2015.



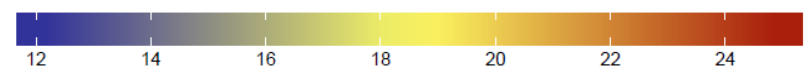
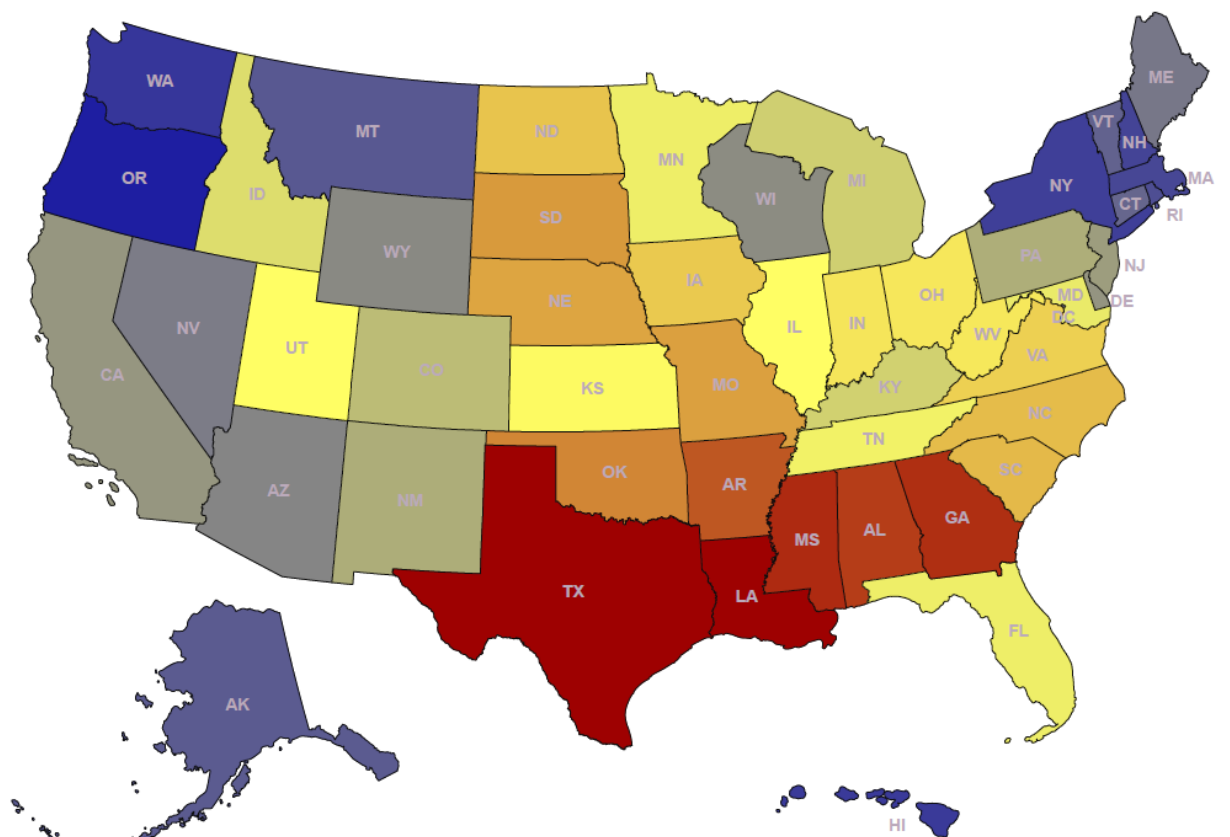
Opioid users (%) among  
Medicare Part D  
beneficiaries, cumulative  
2006-2015.



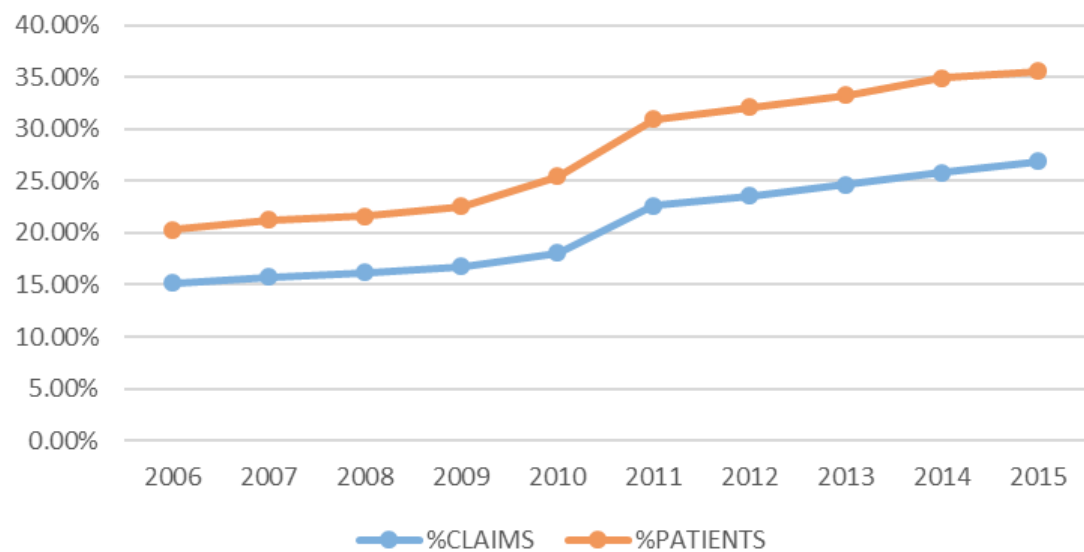
FENTANYL,  
users per 100 eligible PD beneficiaries, 2006–2015.



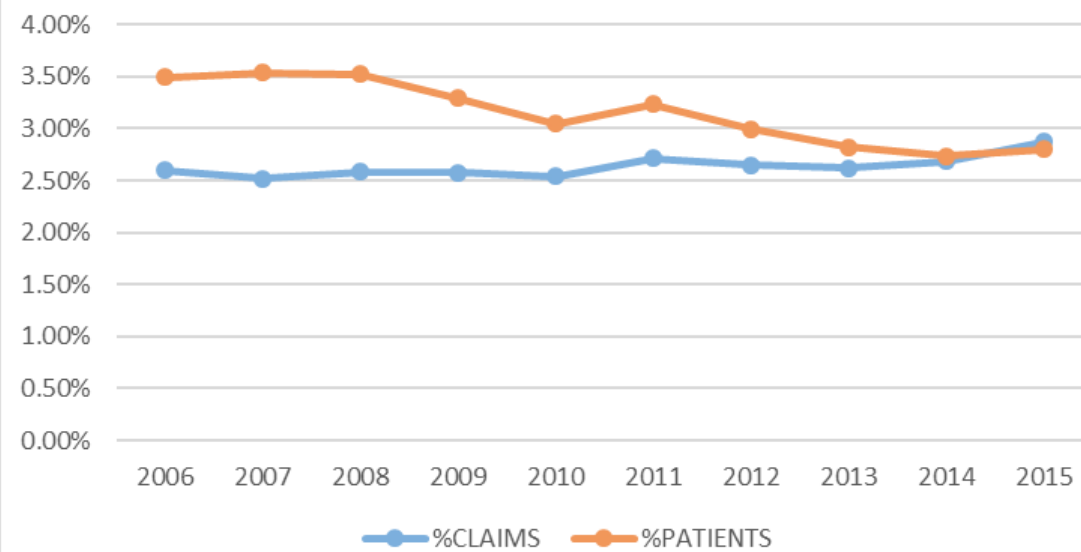
TRAMADOL,  
users per 100 eligible PD beneficiaries, 2006–2015.



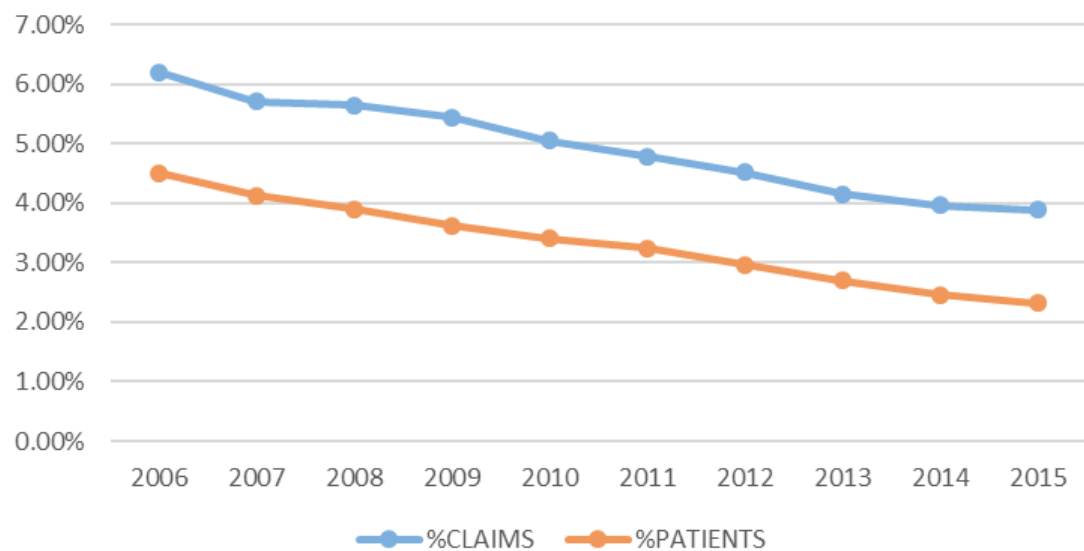
### TRAMADOL



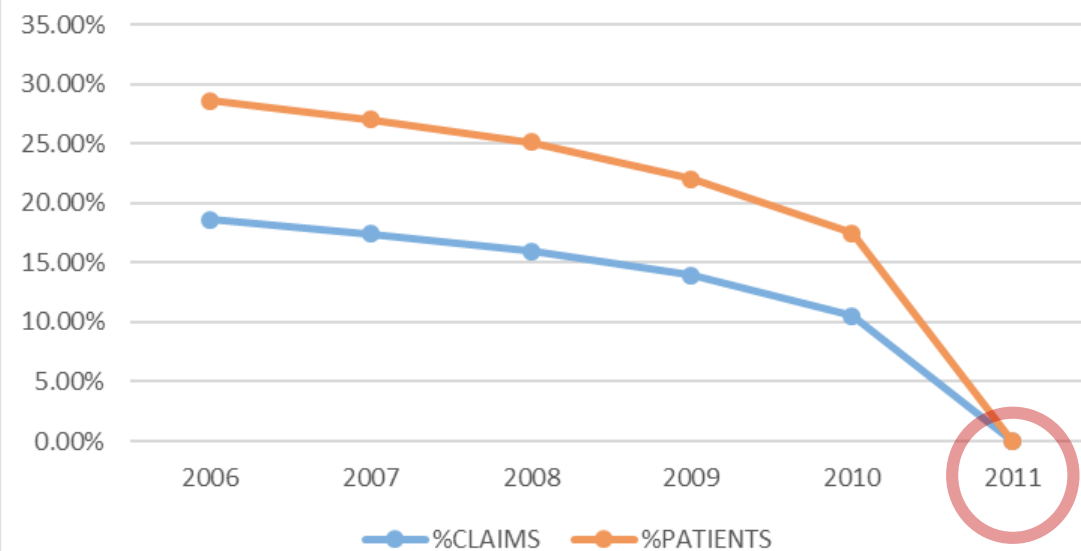
### MORPHINE



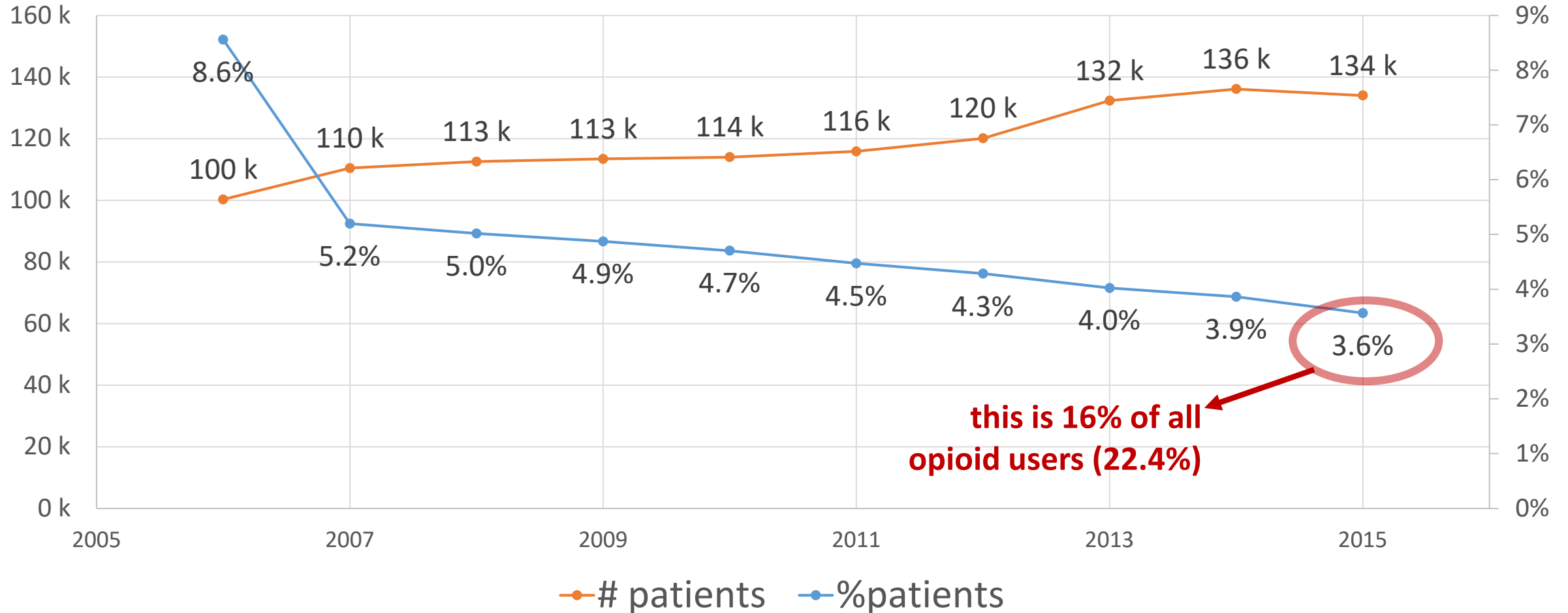
### FENTANYL



### PROPOXYPHENE



# Concomitant prescription of selective serotonin reuptake inhibitors (SSRIs)

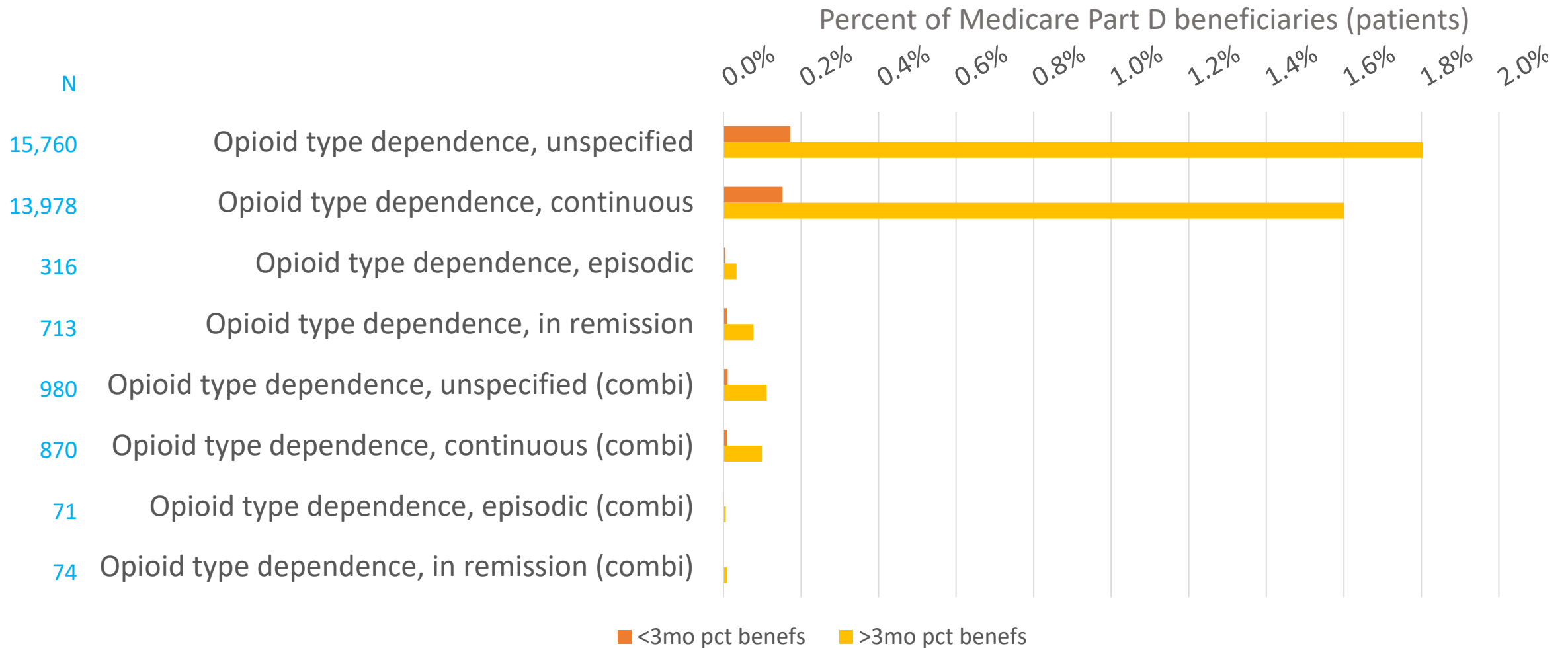




# Predictors of readmission, future overdose

	30-DAY READMISSION 2,259 OUT OF 8,798 WERE READMITTED IN		3,032 OUT OF 8,798 WERE READMITTED IN 60 DAYS		971 OUT OF 8,798 HAD SUBSEQUENT RX OVERDOSE	
	P-VALUE		P-VALUE		P-VALUE	
AGE AT THE FIRST ADMISSION TO ER	0.98	<.0001	0.98	<.0001	0.92	<.0001
FEMALE	0.91	0.1968	0.84	0.0118	0.66	<.0001
BLACK	1.11	0.2317	1.15	0.0966	1.56	<.0001
HISPANIC	0.99	0.9049	1.11	0.3264	1.40	0.0164
ASIAN	0.91	0.7083	1.21	0.3827	0.83	0.6449
OTHER	1.11	0.641	1.11	0.6068	0.86	0.6244
DUAL EVER	0.91	0.1046	0.92	0.1178	1.65	<.0001
NON-DUAL LIS	1.11	0.4712	0.98	0.9123	1.06	0.8198
LIVING IN RURAL AREA	1.26	0.0002	1.18	0.0047	0.74	0.0019
AMI	1.46	<.0001	1.43	<.0001	0.71	0.0252
DEPRESSION	0.89	0.2931	0.88	0.1931	1.40	0.0118
LUNG CANCER	1.18	0.1726	1.22	0.0768	0.52	0.0033
ANEMIA	1.17	0.018	1.26	0.0002	1.02	0.8439
BIPOLAR DISORDER	1.53	<.0001	1.50	<.0001	1.08	0.5326
MAJOR DEPRESSIVE AFFECTIVE DISORDER	1.50	<.0001	1.42	0.0001	0.89	0.3754
PERSONALITY DISORDERS	1.49	0.0023	1.57	0.0004	1.82	0.0015
EPILEPSY	1.19	0.072	1.27	0.0082	0.96	0.7902
FIBROMYALGIA, CHRONIC PAIN AND FATIGUE	1.19	0.0024	1.27	<.0001	1.20	0.0266
VIRAL HEPATITIS (GENERAL)	1.29	0.0074	1.25	0.0119	1.49	0.0004
LEUKEMIAS AND LYMPHOMAS	1.50	0.0071	1.37	0.0306	0.47	0.0269
MIGRAINE AND OTHER CHRONIC HEADACHE	0.95	0.5877	1.02	0.7961	1.39	0.0103
MOBILITY IMPAIRMENTS	1.01	0.8752	1.02	0.8348	0.70	0.0187
TOBACCO USE DISORDERS	1.18	0.0069	1.18	0.003	1.31	0.0008

# OUD, heavy users vs. non-heavy

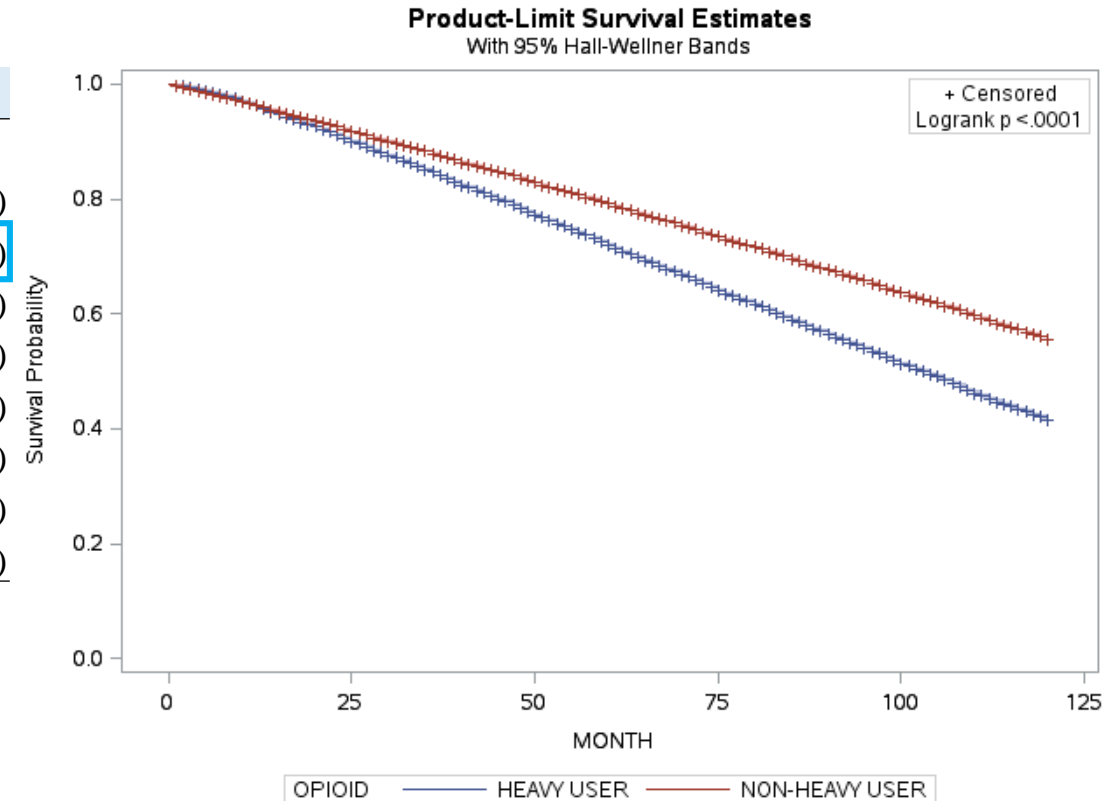


\* Restricted to claims before OUD.

# Mortality, heavy users vs. non-heavy

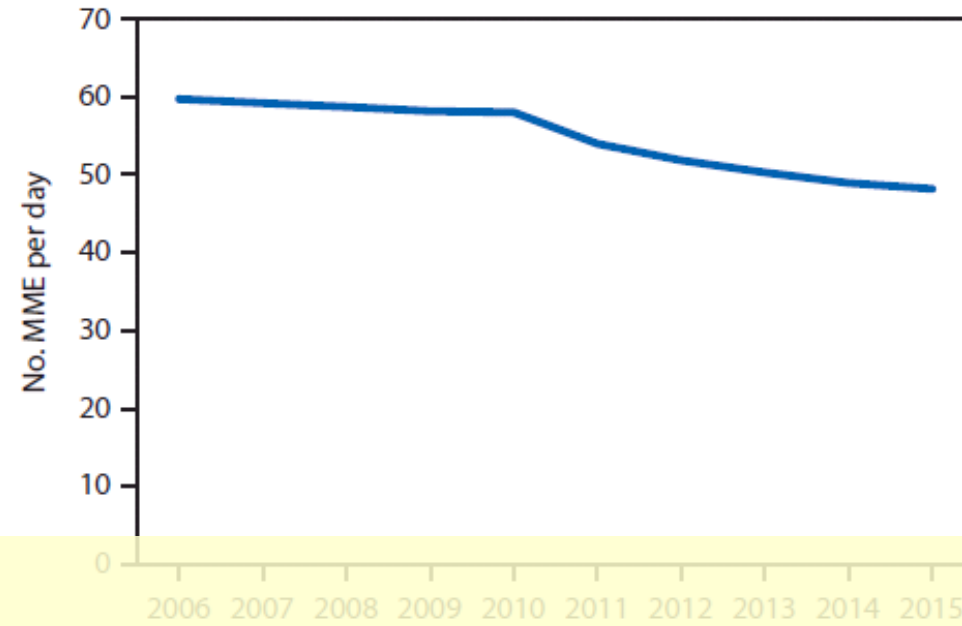
## 2. ADJUSTED - COX PH REGRESSION

	REFERENCE	WALD	HR (95% CI)
OPIOID HEAVY USERS	NON-HEAVY USERS	4119.76	1.24(1.23,1.25)
AGE		434828.34	1.12(1.12,1.12)
FEMALE	MALE	10268.91	0.72(0.72,0.73)
BLACK	WHITE	246.27	1.08(1.07,1.09)
HISPANIC	WHTIE	764.50	0.84(0.83,0.85)
ASIAN	WHITE	2552.37	0.60(0.59,0.61)
OTHER	WHITE	19.50	0.94(0.92,0.97)



# Limitations

Comparing analyses is difficult.  
Methodological nuances often go  
unreported.



Please release your source code.

*What drugs considered? What about drug combinations? What population? What patient eligibility criteria? What ICD codes? Were outliers excluded? By prescription or by patient?...*





*Thank you for your  
attention.*

## Opioid Use and Misuse in the American Elderly Population

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[github.com/fabkury/opod](https://github.com/fabkury/opod)



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