

Trends in Opioid Use Among Social Security Disability Insurance Applicants

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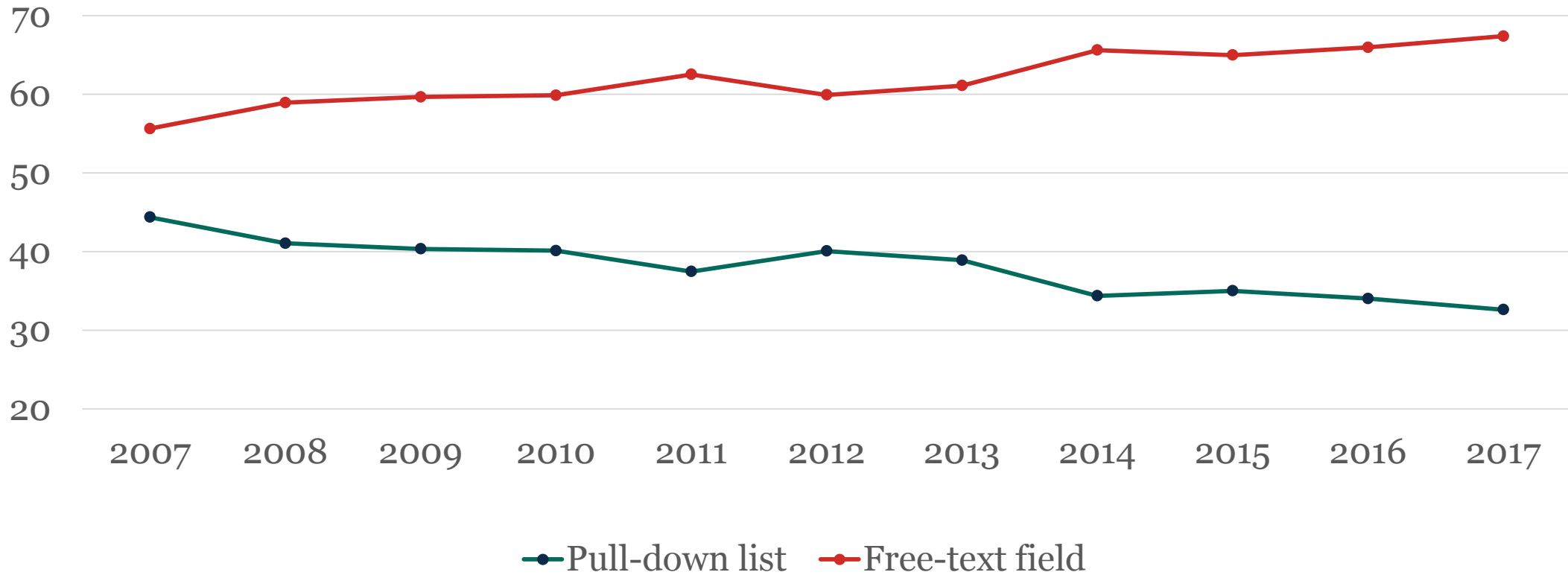
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The Opioid Crisis and DI Applicants

- **Opioid use is prevalent in the United States**
- **It's unclear how opioids affect health and work capacity**
- **Opioid use may be common among people applying for Social Security Disability Insurance (DI)**
- **Opioid use among applicants has implications for the DI program**

Most Medications Reported in Free-Text Fields

Percentage of all medications reported via pull-down list versus free-text fields



The Challenge: Free-Text Medication Data

PIN	MEDCN_CD	MEDCN_DESC	YEAR
1	0	zyprexa	2007
1	0	PAXIL	2007
1	183		2007
2	0	HYDRcodone	2009
2	343		2011
3	0	percocet	2013
4	0	COLCHICINE	2013
4	0	i dont know because micheal cant remember	2013
5	0	Morphine-30mg/2xday	2017
6	0	unknown	2017

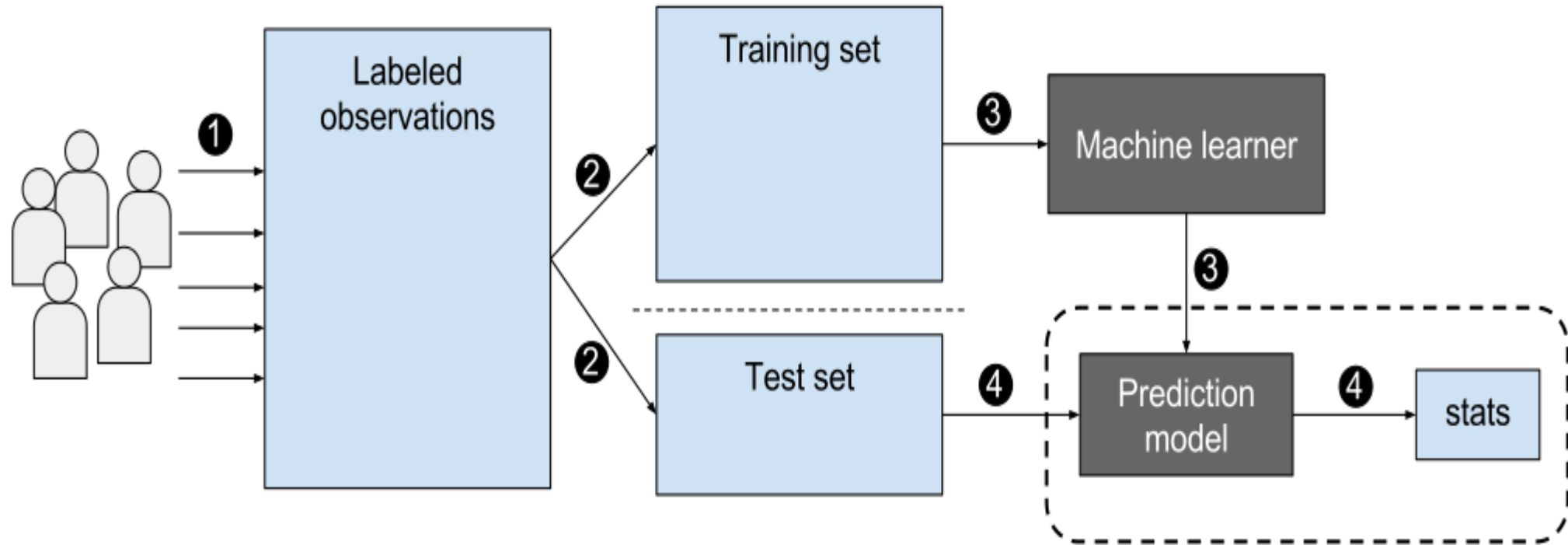
Toprol

Relafen

Research Plan

- **Medication information from applications (SDR)**
- **30% sample of DI applicants in each year from 2007 to 2017**
 - About 6.5 million applications
- **Machine-learning approach to classify free-form text; also to classify medications from pull-down lists**
 - Wu (2018)
- **Document trends in opioid use overall and by subgroups**

Machine-Learning Algorithm: Spot On!

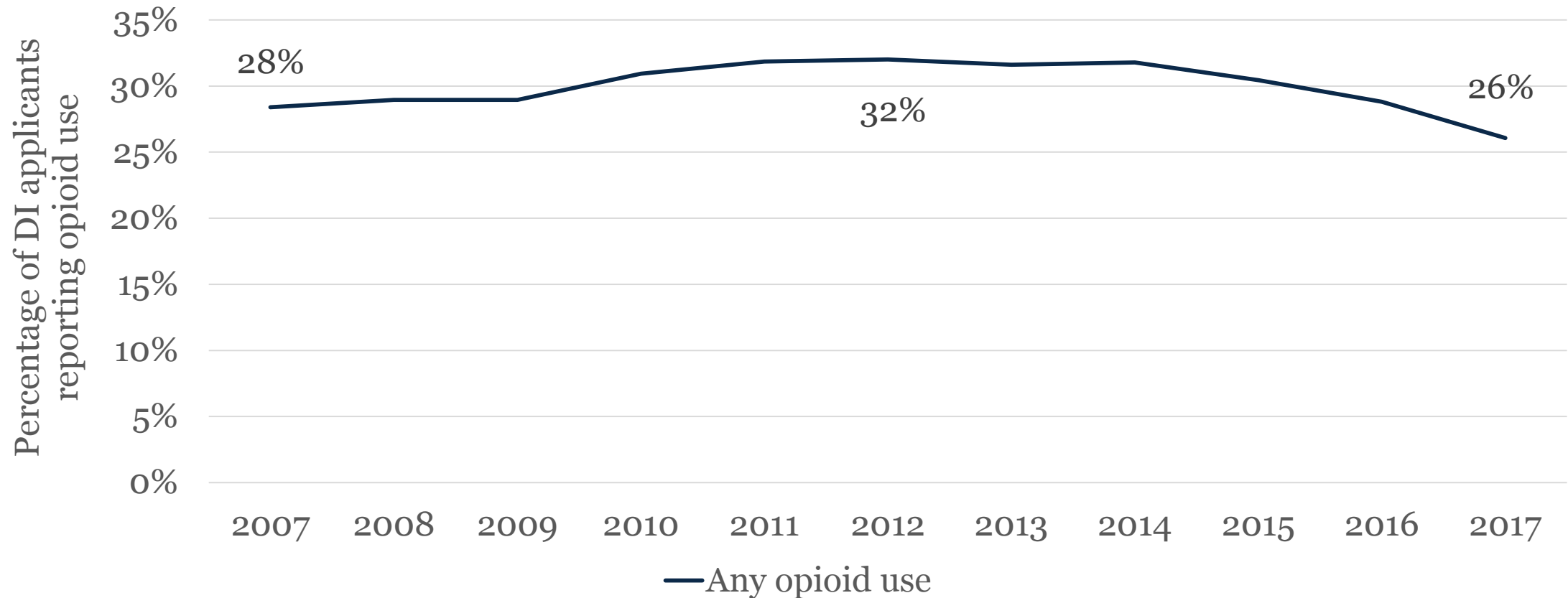


99% accuracy rate

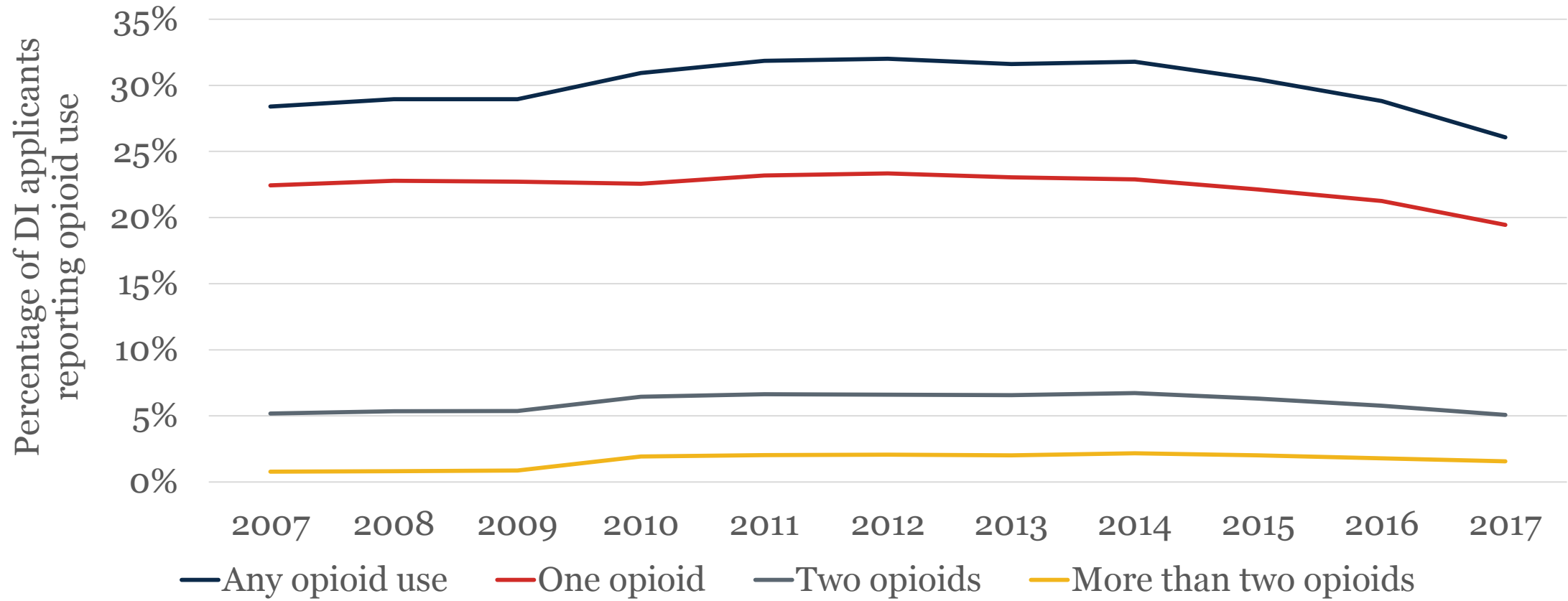
Top 10 Most Commonly Reported Opioids

Ranking	Opioid substances	Occurrences	Fraction
1	Hydrocodone	485,750	16.1%
2	Tramadol	414,924	13.7%
3	Oxycodone	337,818	11.2%
4	Percocet	263,916	8.7%
5	Vicodin	226,346	7.5%
6	Norco	149,898	5.0%
7	Lortab	146,858	4.9%
8	Morphine	128,533	4.3%
9	OxyContin	71,739	2.4%
10	Ultram	53,218	1.8%

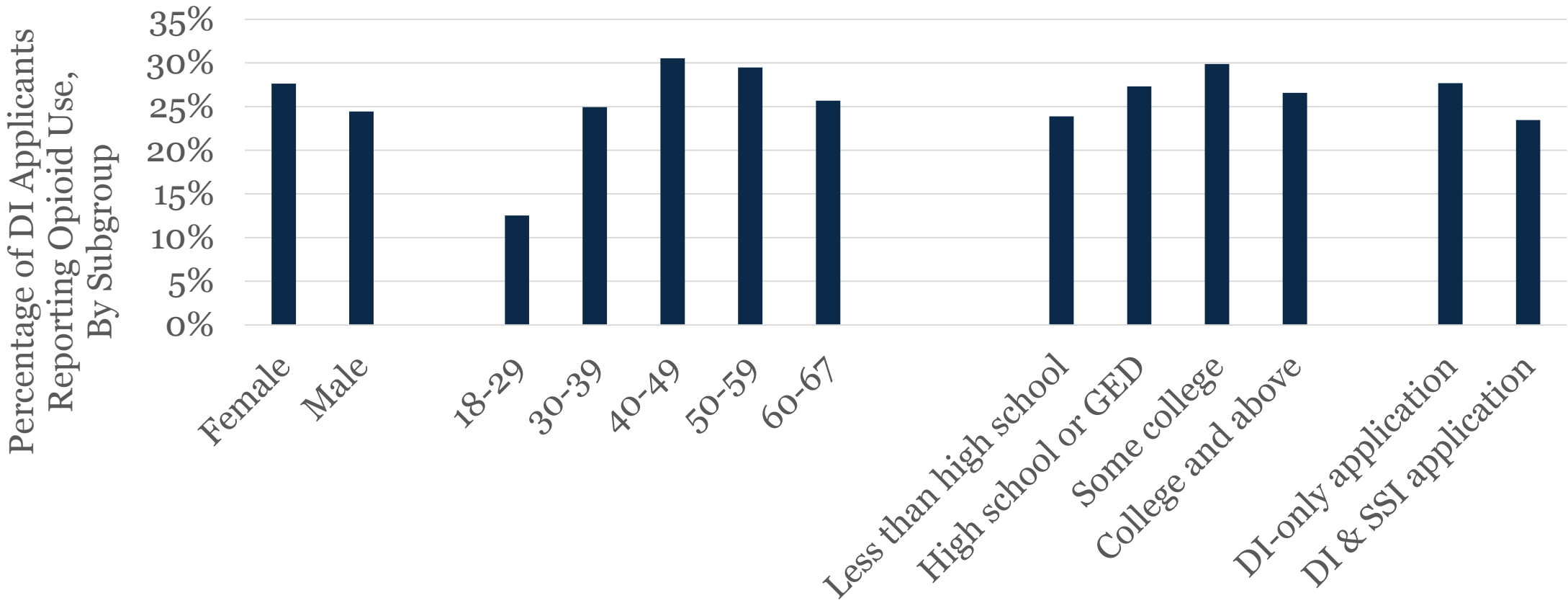
Prevalence of Prescription Opioid Use Among DI Applicants



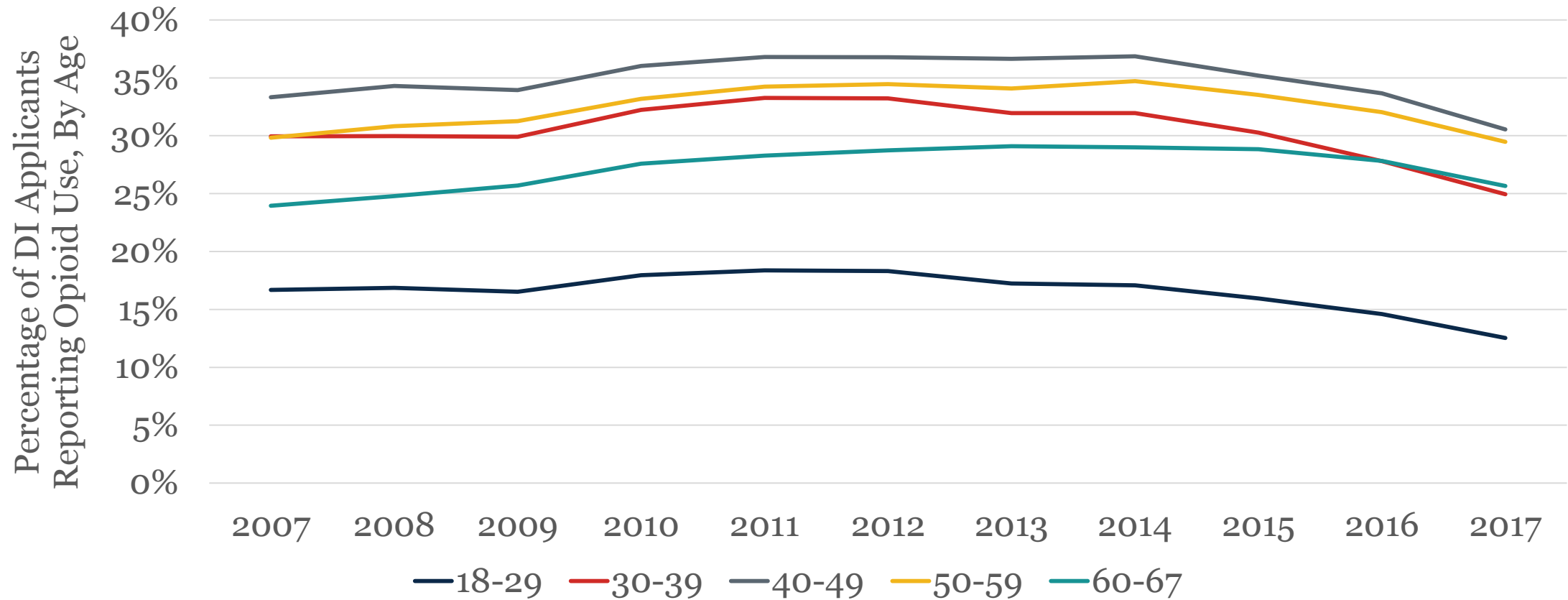
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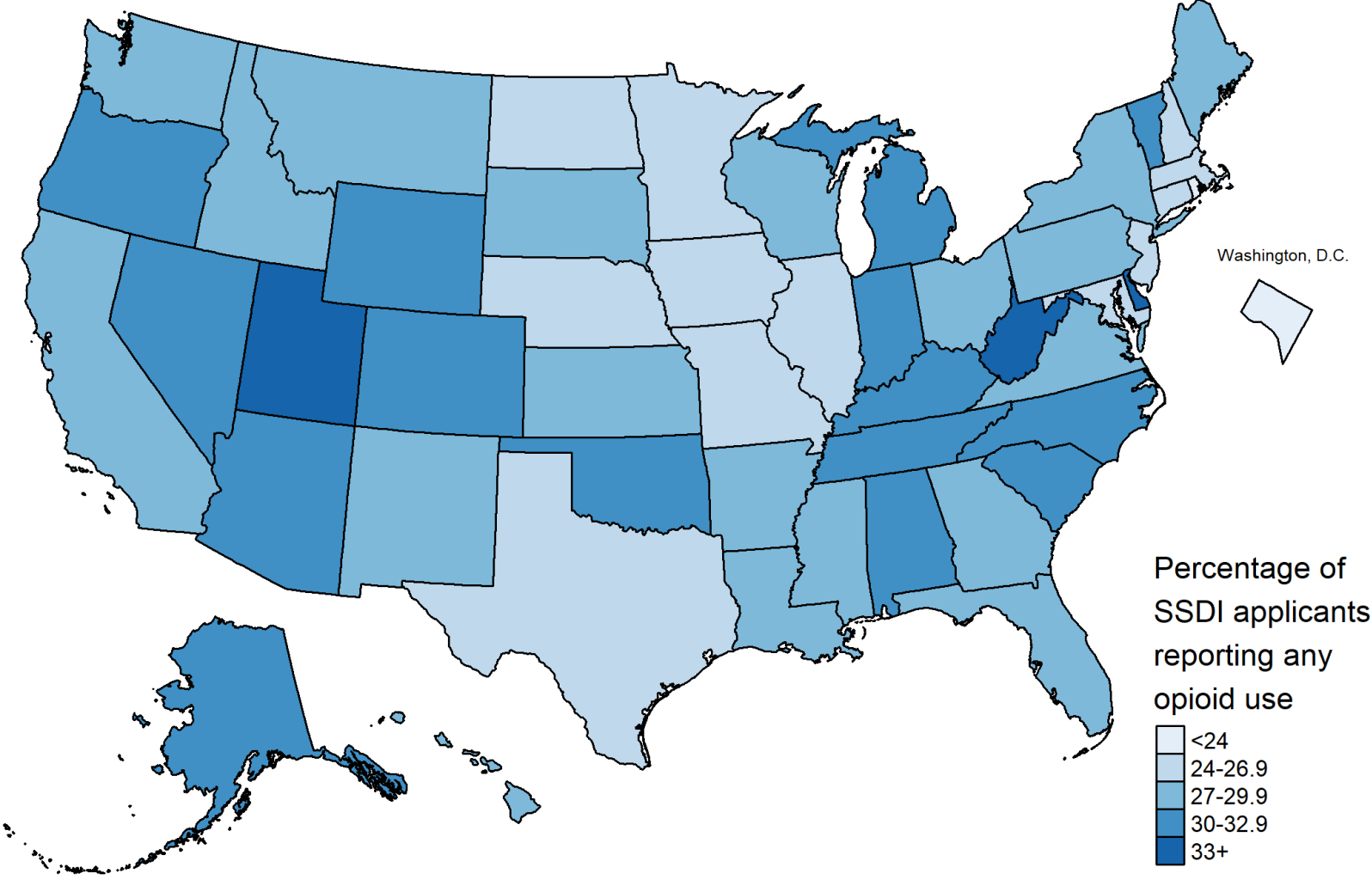
Opioid Use Highest Among Certain Groups (2017)



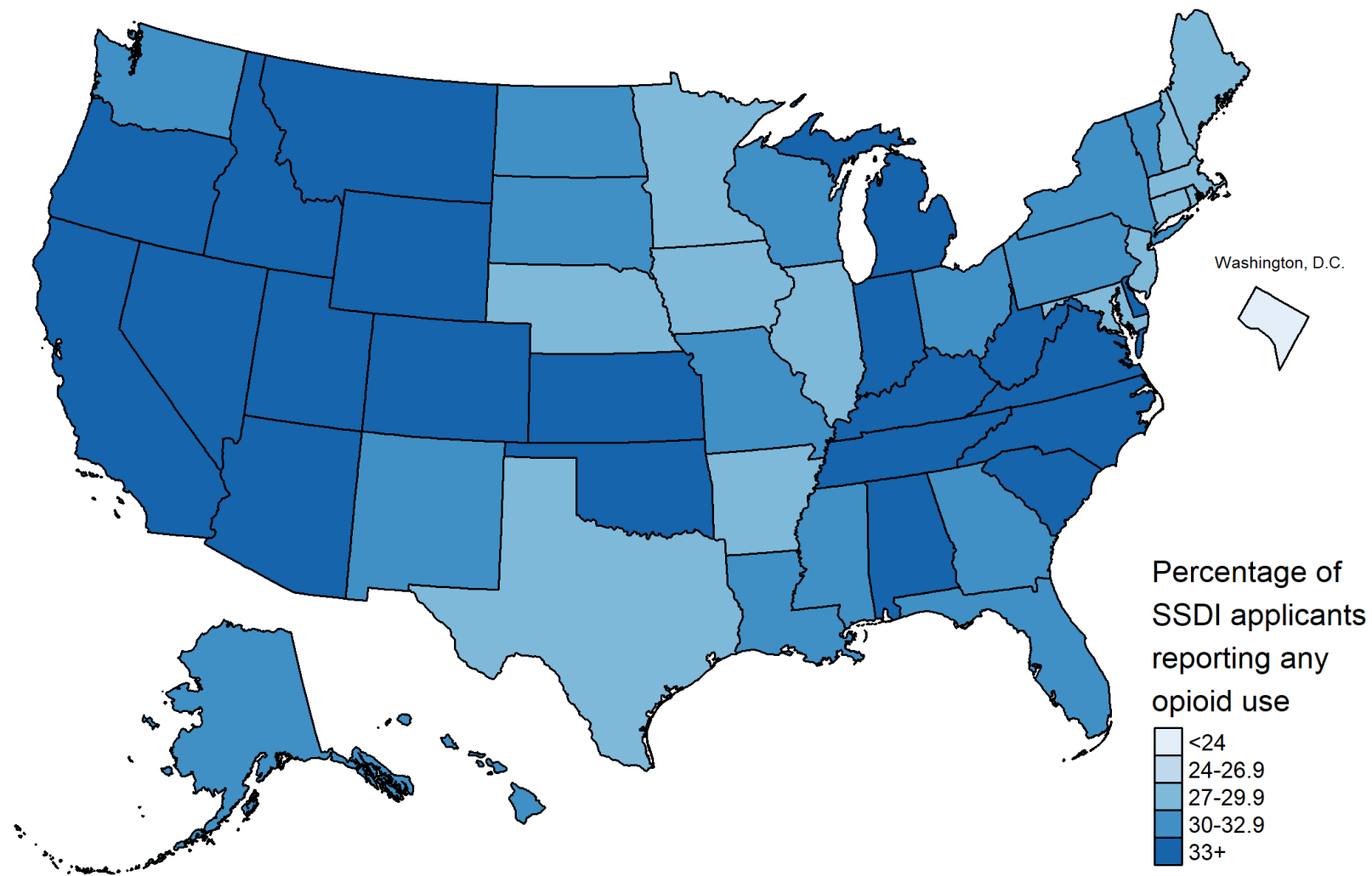
Differences in Trends by Age



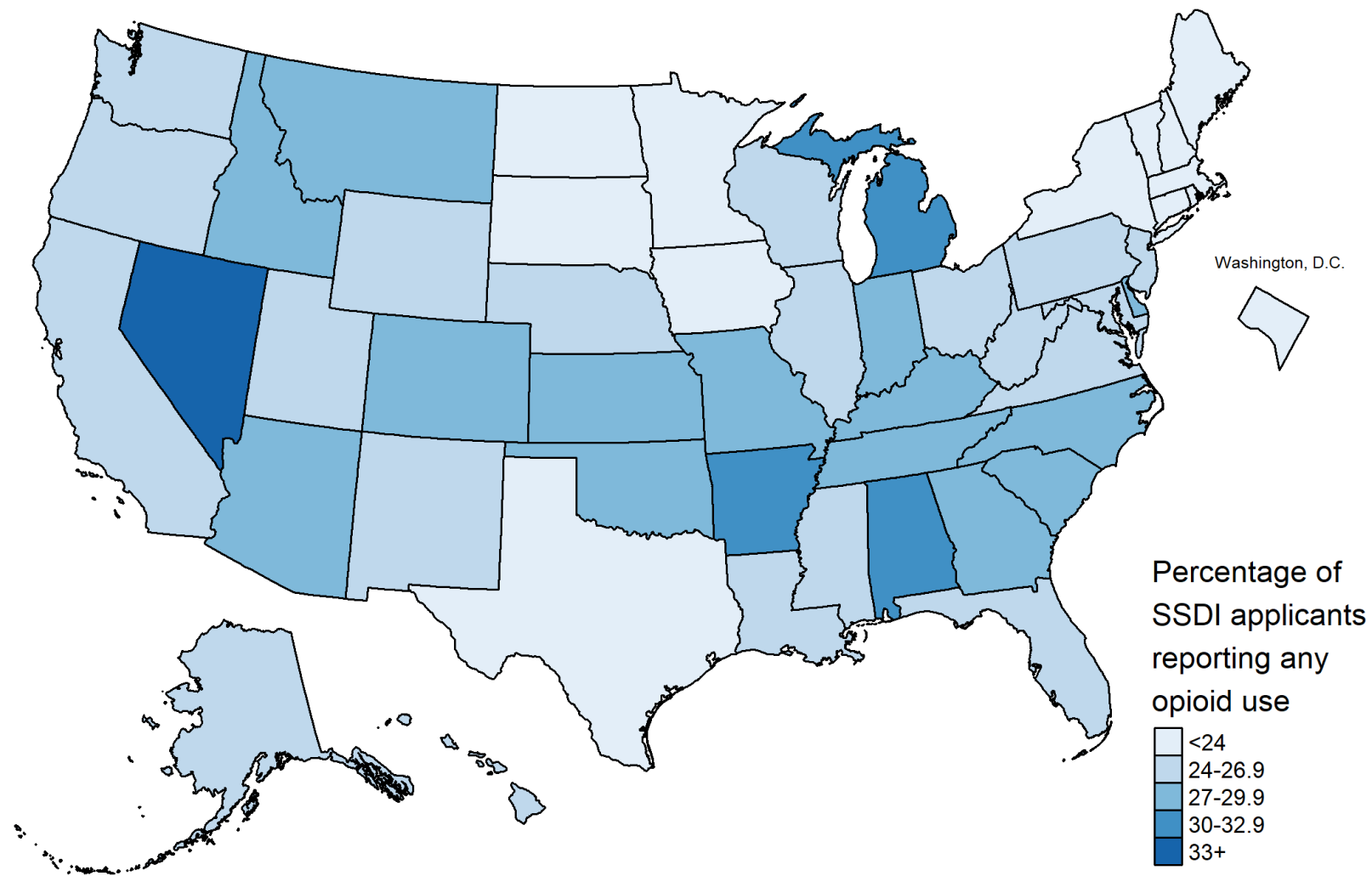
Opioid Use Varied by State in 2007



...and in 2012...



...and in 2017



Conclusion

- **Successfully applied a machine learning algorithm to SSA administrative data**
 - 99% accuracy rate
 - Estimated 65% reduction in costs
- **Opioid use is common among DI applicants**
- **What causes changes in opioid use among applicants?**
 - Trends in opioid-prescribing practices
 - Changes in the composition of DI applicants
- **DI application is an opportunity to connect opioid users with services**

Future Research

- **What factors affect trends in opioid use among DI applicants?**
- **What is the association between opioid use at application and DI award or death within five years?**
 - Wu, Hoffman, O'Leary work in progress
- **What is the association between opioid use at application and subsequent employment outcomes?**
 - Wu, Hoffman, O'Leary proposal
- **What are the trends in the use of mental health medication among applicants?**
 - Application of Wu's (2018) machine-learning algorithm

For More Information

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