

# Trends in Opioid Use Among Social Security Disability Insurance Applicants

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# Disclaimer

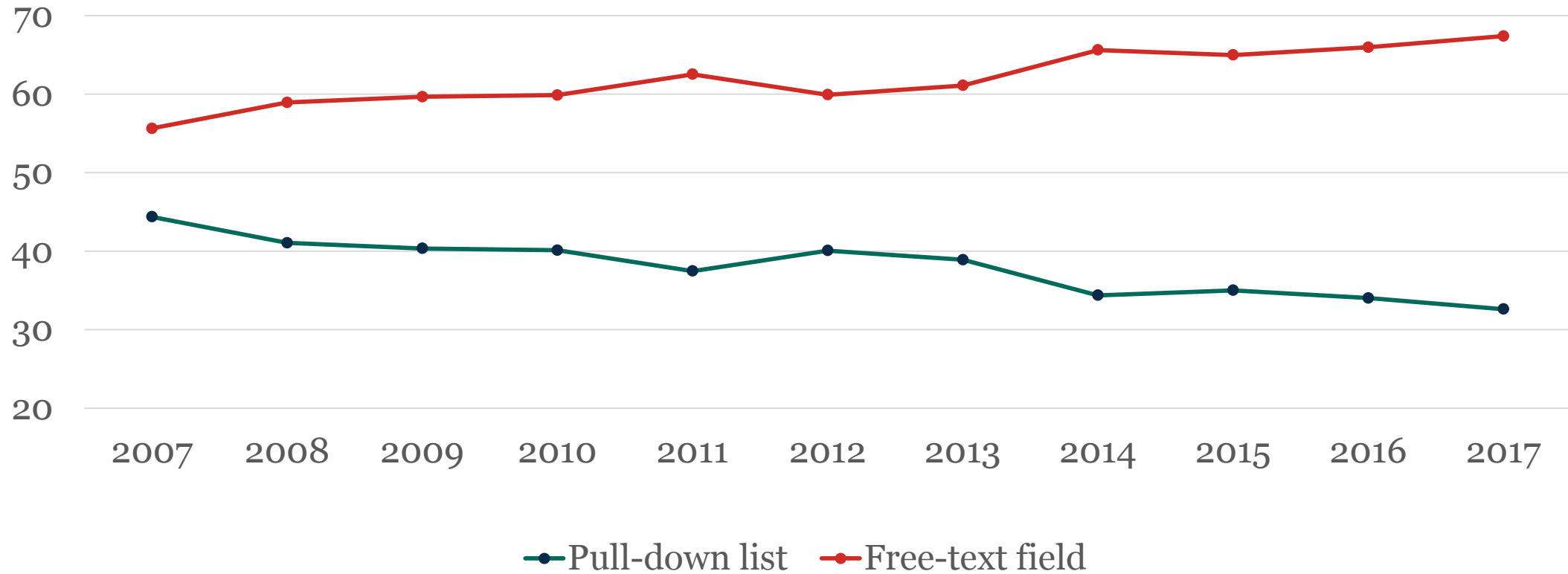
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# The Opioid Crisis and DI Applicants

- **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

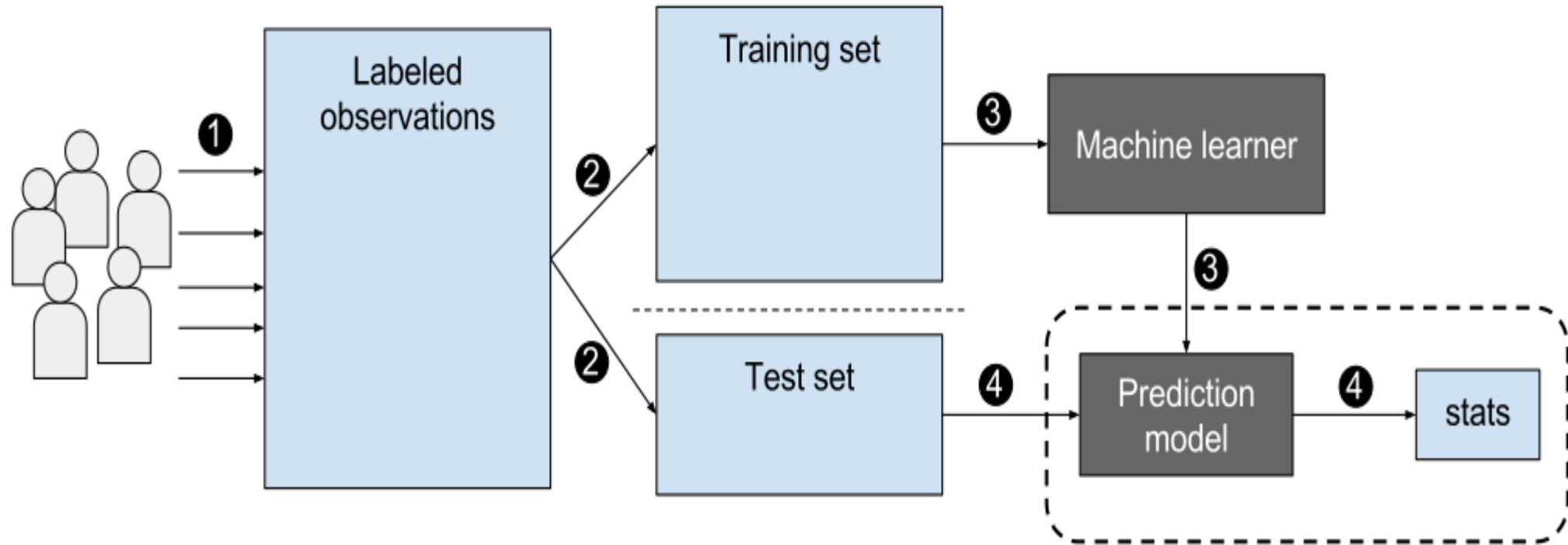
Toprol

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!



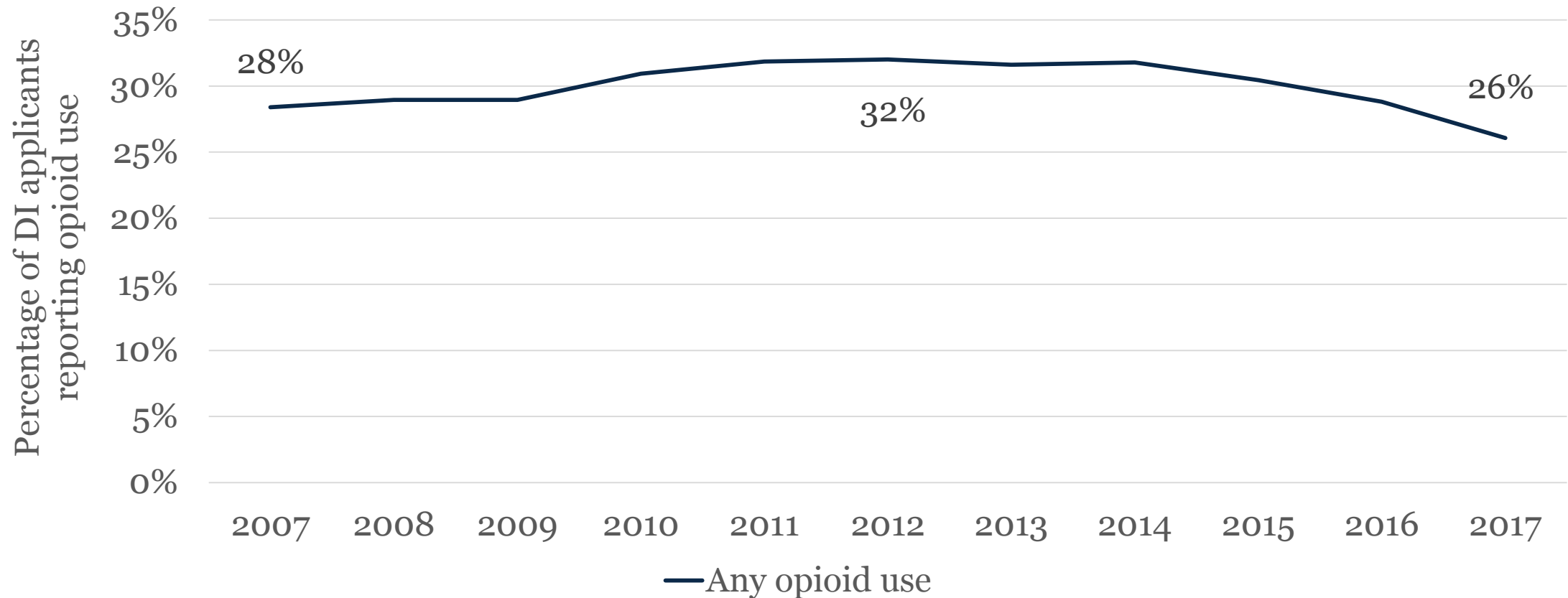
**99% accuracy rate**

# Top 10 Most Commonly Reported Opioids

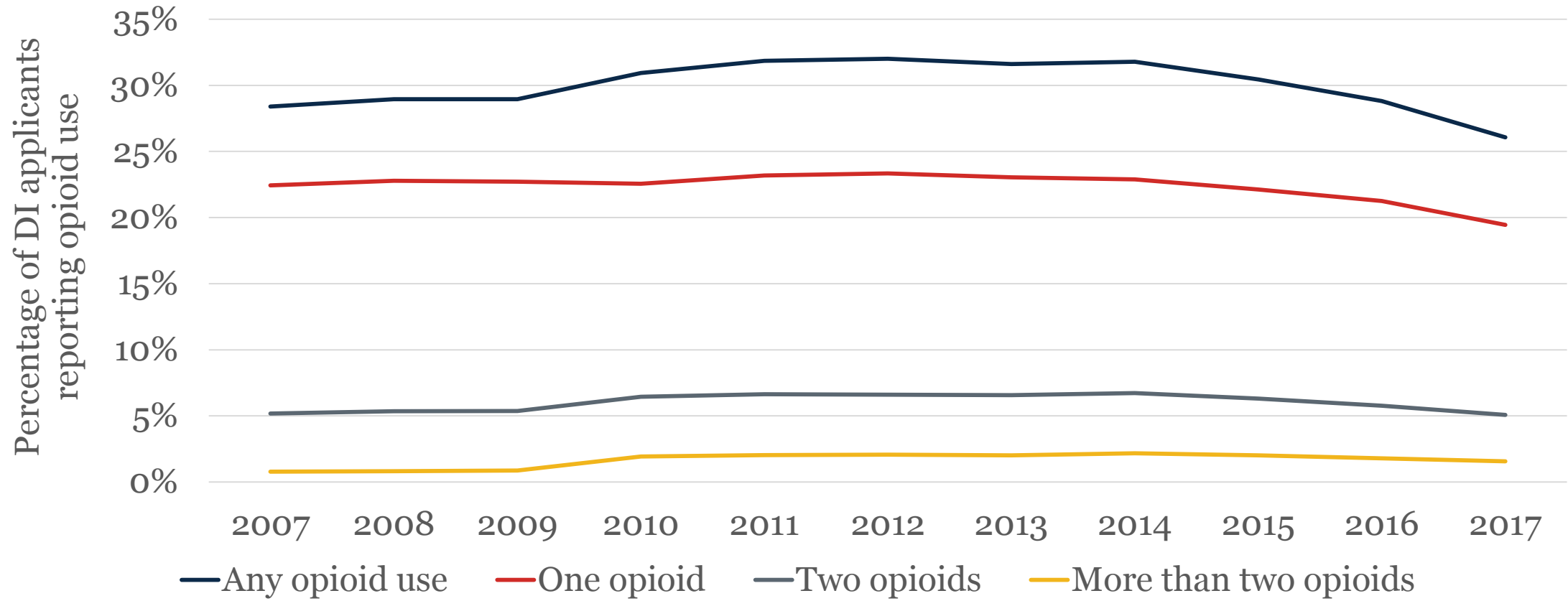
Ranking	Opioid substances	Occurrences	Fraction
1	Hydrocodone	485,750	16.1%
2	Tramadol	414,924	13.7%
3	Oxycodone	337,818	11.2%
4	Percocet	263,916	8.7%
5	Vicodin	226,346	7.5%
6	Norco	149,898	5.0%
7	Lortab	146,858	4.9%
8	Morphine	128,533	4.3%
9	OxyContin	71,739	2.4%
10	Ultram	53,218	1.8%



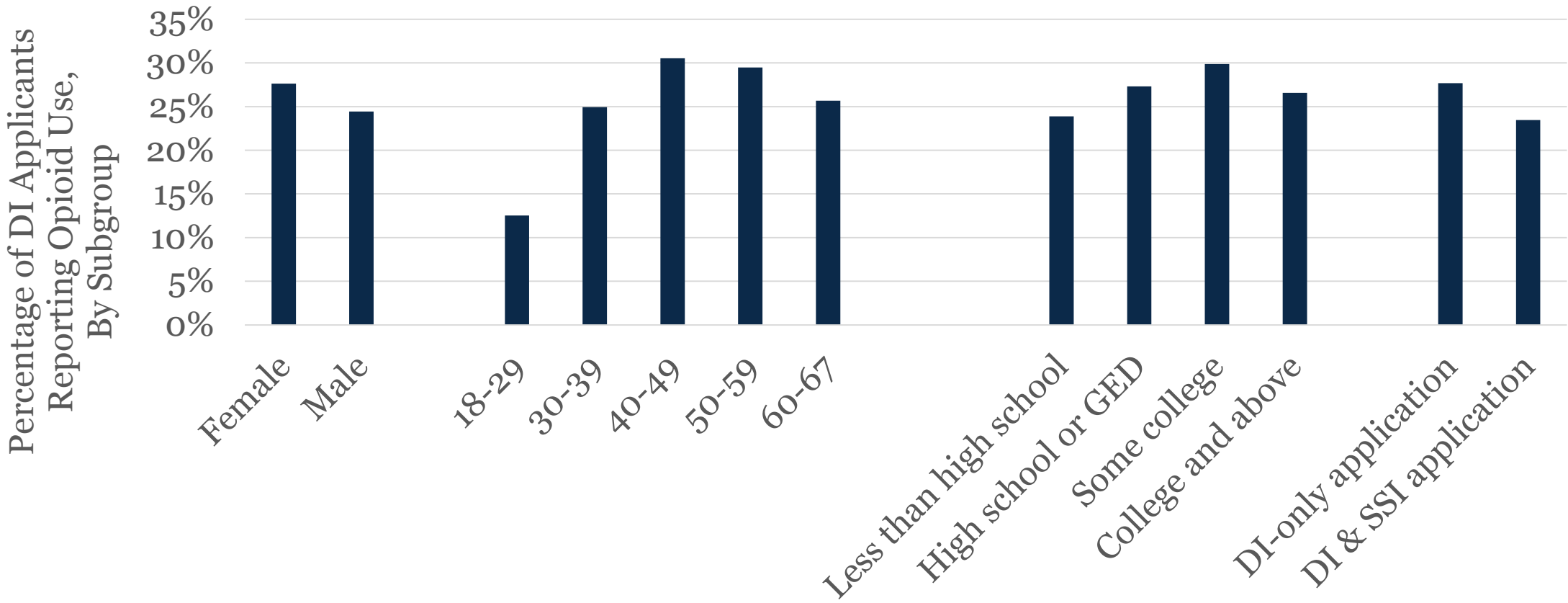
# Prevalence of Prescription Opioid Use Among DI Applicants



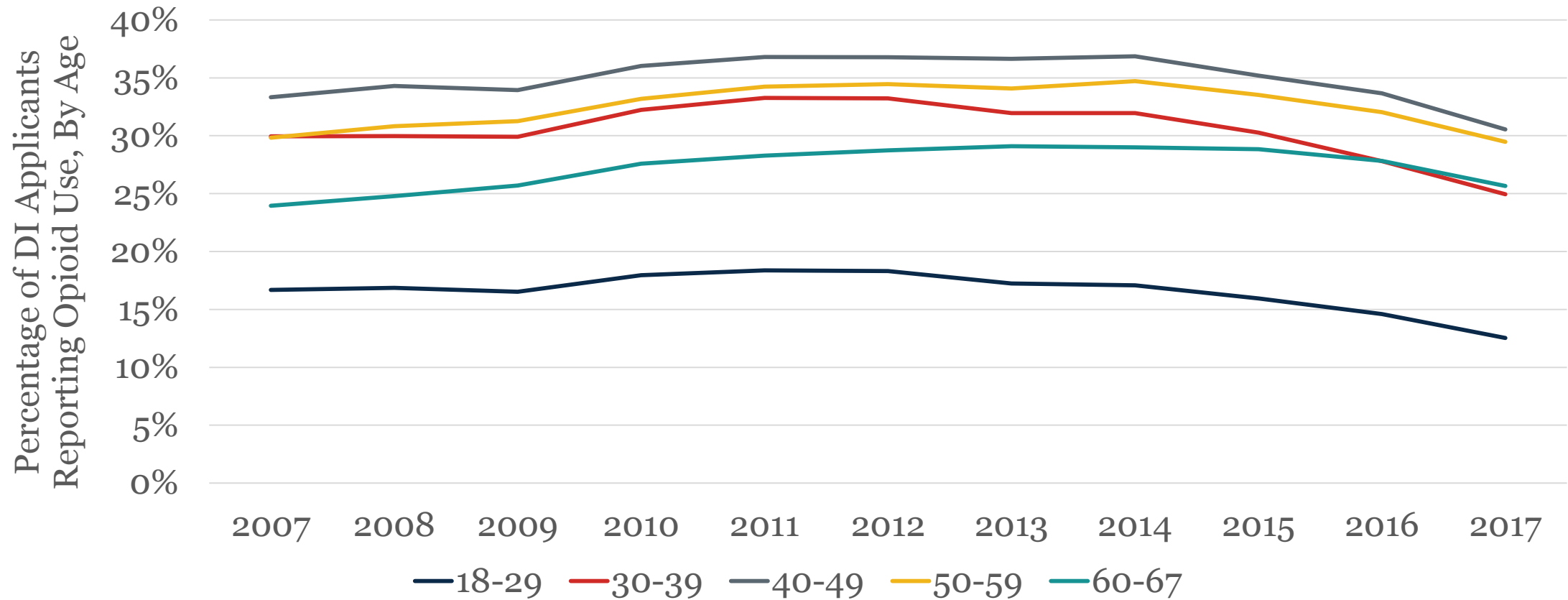
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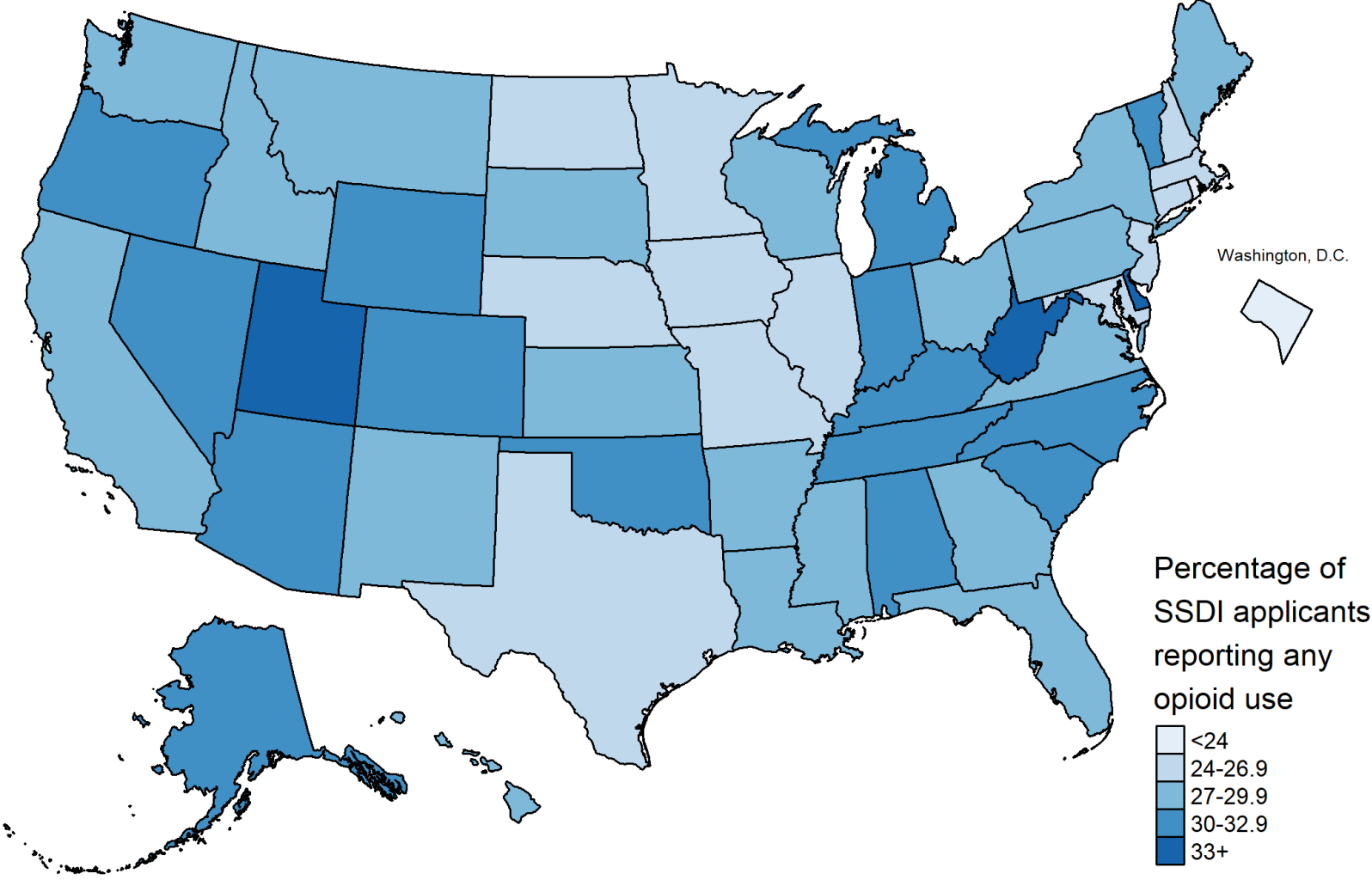
# Opioid Use Highest Among Certain Groups (2017)



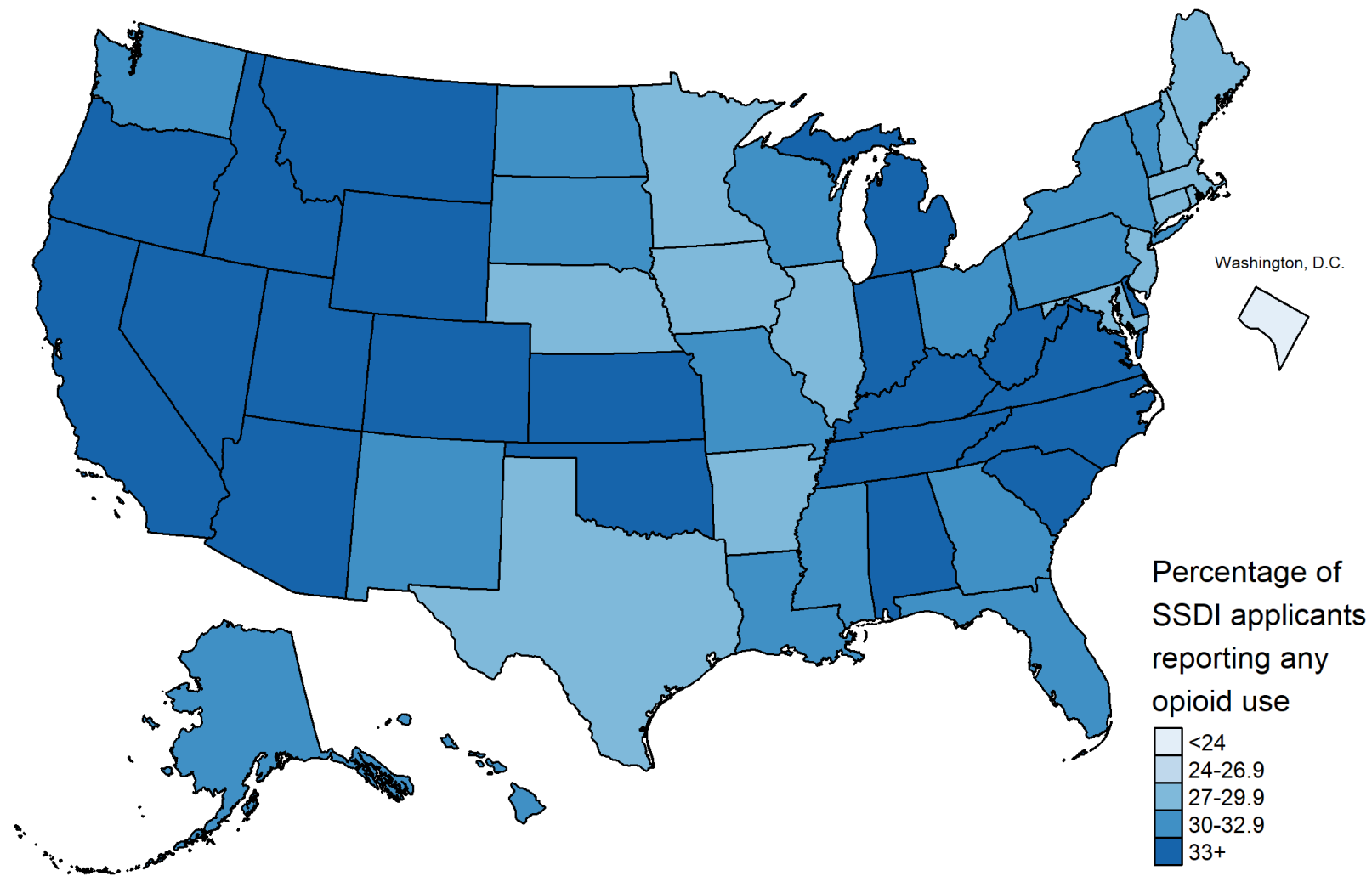
# Differences in Trends by Age



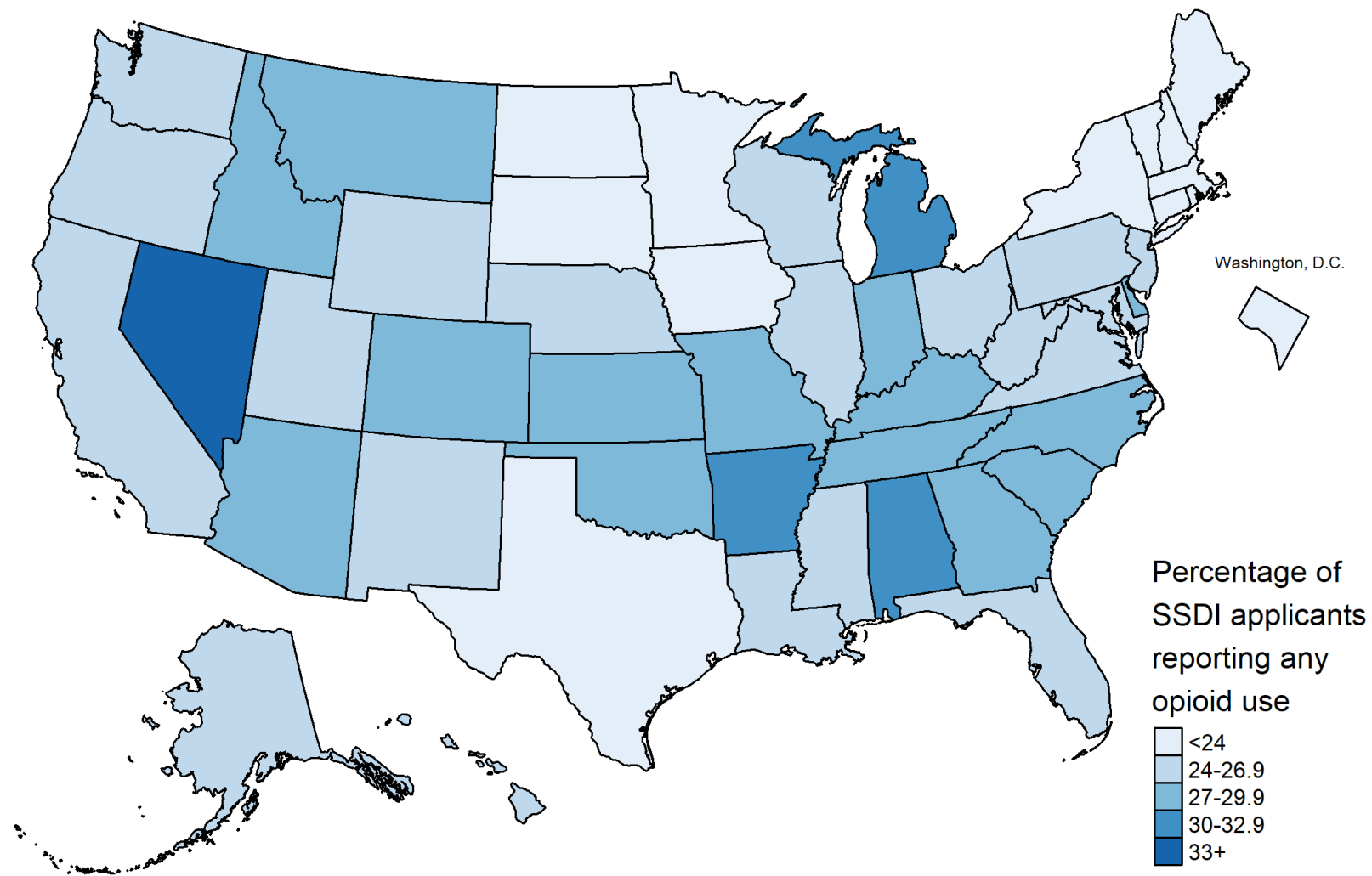
# Opioid Use Varied by State in 2007



# ...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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