

Michigan: MAPS updates and Statewide Opioid Assessment

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Presented by:
Haley Winans, Senior Analyst
Amber Daniels, Analyst
Michigan Automated Prescription System (MAPS)

Kristine Whalen, Data Scientist
Appriss Health

MAPS Background

- Contains over 120 million records
- Data maintained for 5 years
- Required reporting of CS Schedule 2-5 from:
 - Prescribers who dispense CS Schedule 2-5
 - Pharmacists (dispensers)
 - Veterinarians



MAPS Reporting Requirements

- Board of Pharmacy Rule 338.3162b outlines prescription information that must be reported to MAPS. Information includes:
 - Patient identification number
 - If under age 16, all zeroes shall be submitted
 - If patient is an animal, positive identification of the animal's owner
 - Quantity
 - National Drug Code (NDC)
 - Prescription issue date
 - Prescription fill date
 - Estimated day supply
 - Prescription number
 - Prescriber DEA number
 - Dispenser DEA number
- Accuracy in reporting is extremely important, as MAPS is a tool used by health professionals, law enforcement and regulatory agencies, and benefit plan managers
 - **Ex: Correct prescriber DEA number of who issued prescription**



Controlled Substance Prescriptions Filled in Michigan by Year

	Total CS prescriptions dispensed	% change from previous year
2007	17,007,858	
2008	17,400,640	2.31%
2009	17,876,684	2.74%
2010	18,954,172	6.03%
2011	19,763,680	4.27%
2012	20,991,020	6.21%
2013	20,728,216	-1.25%
2014	20,904,764	0.85%
2015	21,472,326	2.71%
2016	21,092,674	-1.77%
2017	19,943,203	-5.45%
2018*	17,647,424	-11.51%

**2018 numbers are provisional as of 3/18/2019*



Opioid Prescriptions Filled in Michigan by Year

	Total Opioid Prescriptions Dispensed	% Change from Previous Year
2013	9,920,288	
2014	10,301,142	3.84%
2015	10,833,681	5.17%
2016	10,507,059	-3.01%
2017	9,670,789	-7.96%
2018*	8,222,821	-14.97%

**2018 numbers are provisional as of 3/18/2019*



Commonly Abused Controlled Substances Filled in Michigan (Summary)

	Alprazolam 1 mg	Alprazolam 2 mg	Carisoprodol 350 mg	Promethazine with Codeine
2015	41,499,216	10,227,915	13,124,785	41,758,634
2016	39,040,420	8,618,772	10,442,641	34,803,234
2017	34,379,472	6,939,880	7,808,190	28,579,490
2018*	27,848,793	5,118,449	4,904,665	15,968,655
% Change from 2015 to 2016	-5.92%	-15.73%	-20.44%	-16.66%
% Change from 2016 to 2017	-11.94%	-19.48%	-25.23%	-17.88%
% Change from 2017 to 2018*	-19.00%	-26.25%	-37.19%	-44.13%

	Hydrocodone 7.5 mg	Hydrocodone 10 mg	Oxycodone 30 mg	Oxymorphone 40 mg
2015	107,776,175	177,326,801	16,666,622	1,165,058
2016	99,473,052	172,038,459	14,859,323	1,358,611
2017	84,705,294	151,080,925	12,306,723	1,502,544
2018*	66,740,705	118,235,299	9,455,736	1,040,765
% Change from 2015 to 2016	-7.70%	-2.98%	-10.84%	16.61%
% Change from 2016 to 2017	-14.85%	-12.18%	-17.18%	10.59%
% Change from 2017 to 2018*	-21.21%	-21.74%	-23.17%	-30.73%

The numbers in these tables are drug totals dispensed by number of units (e.g. number of tablets, milliliters, etc.)

**2018 numbers are provisional as of 3/18/19*



Michigan Board of Pharmacy Rule Update

- Effective **January 4, 2019** Neurontin (gabapentin) is a Schedule 5 controlled substance in the State of Michigan. Further information about this can be found in the [Michigan Board of Pharmacy Administrative Rule 338.3125](#)

Mandatory reporting:

When gabapentin is dispensed in excess of a 48-hour supply

Mandatory MAPS review:

When it is prescribed in excess of a 3-day supply



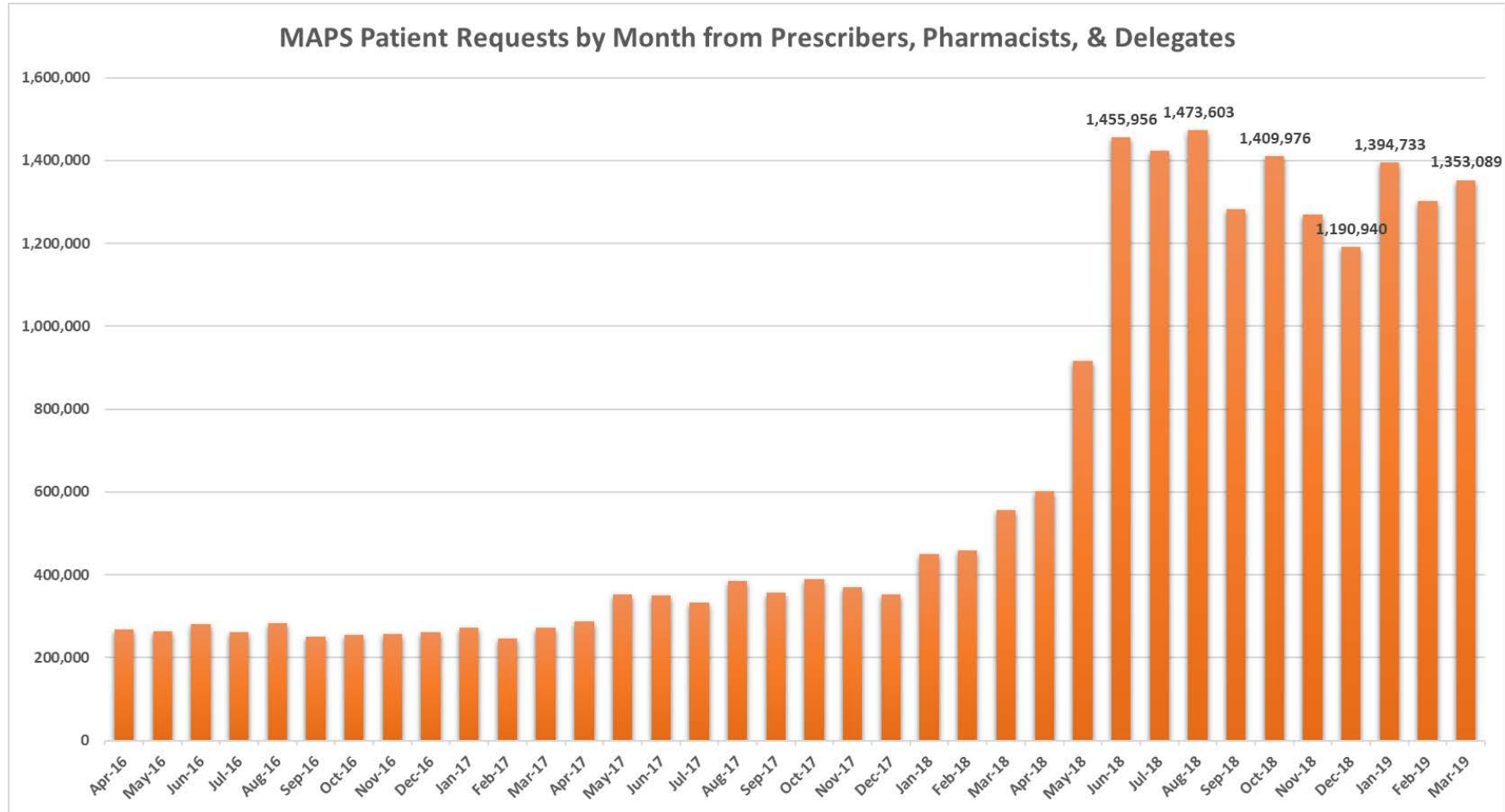
MAPS Update

- Successfully launched Appriss Health's PMP AWARxE on April 4, 2017
- Added Appriss Health's NarxCare report to MAPS on December 4, 2017
- Response times average 0.4-0.8 seconds
- Registered Users:

	As of 4/4/17	As of 4/23/19	Increase
Prescribers	9,156	44,383	35,227
Dispensers (Pharmacists)	3,994	8,344	4,350
Delegate Users	1,096	18,987	17,891



MAPS – Patient Requests



**Note: Includes online requests and integration requests from MAPS (Michigan) registered users*



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Statewide Opioid Assessment: *Michigan*

Identify, Prevent, and Manage Substance Use Disorders

Informed decision making for early intervention and improved outcomes.

Michigan Collaborates with Appriss Health with New Tool in the Fight Against the Opioid Crisis



*The Michigan Department of Licensing and Regulatory Affairs (LARA) is one of the first state government agencies in the nation to utilize this new tool recently developed by Appriss Health in the fight against the opioid crisis; Appriss Health's **Statewide Opioid Assessment**.*

The Methods

- To apply this tool, Michigan provided three years of well-documented cases of unintentional overdose deaths, which Appriss Health linked to five years of prescription records in the state's prescription drug monitoring program (PDMP), the Michigan Automated Prescription System (MAPS). More than 7.5 million patients receiving 103.2 million prescriptions over the five years of PDMP history were linked to 5,261 overdose deaths.

The Value

- Using Appriss Health's Statewide Opioid Assessment, lawmakers and local community leaders can tailor laws, target resources, and design innovative programs to best address the opioid crisis in Michigan. This solution, along with other extensive collaborations underway between Michigan and Appriss Health, demonstrate the aggressive commitment of both entities to impact the opioid crisis in the state.

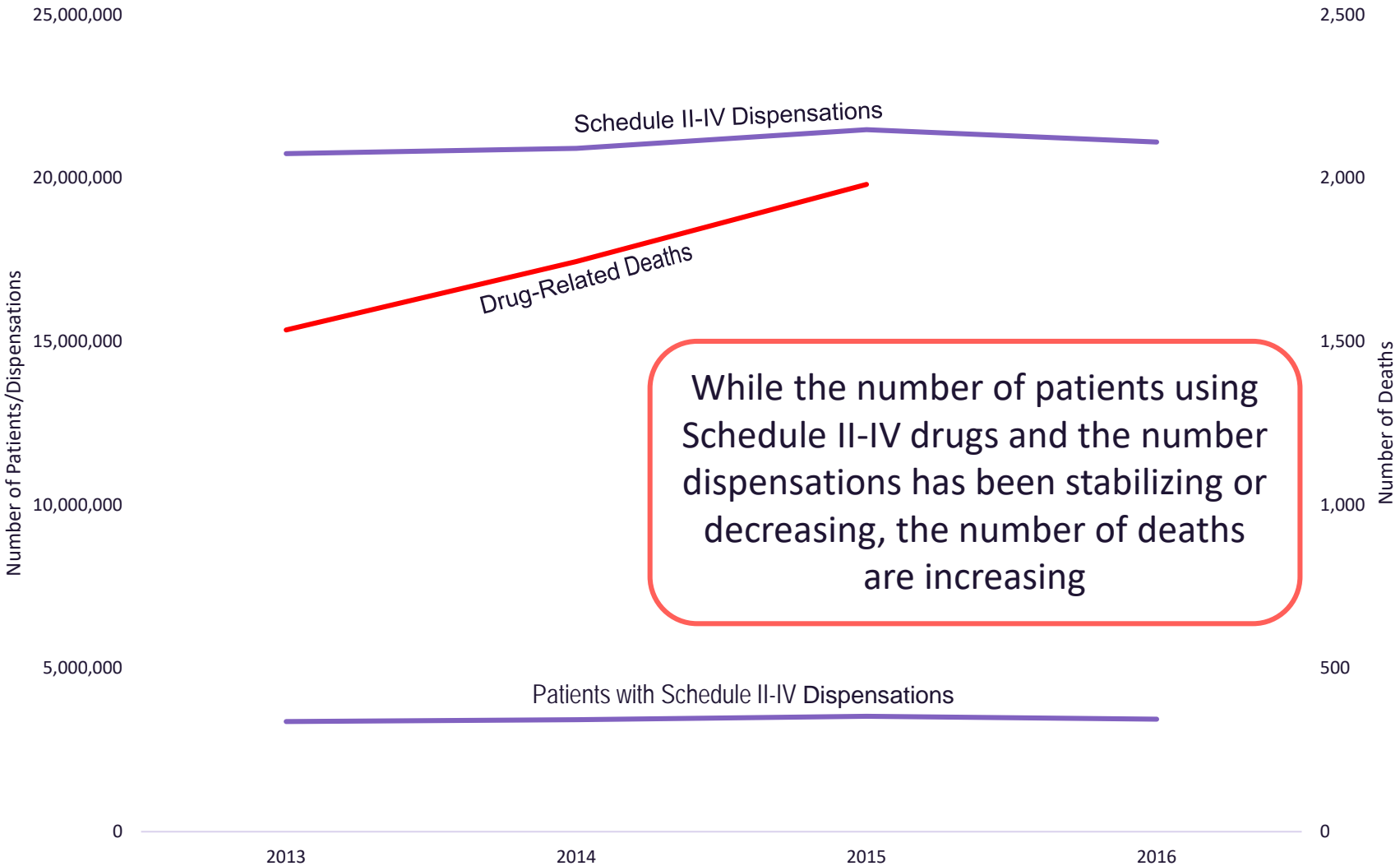
Michigan Collaborates with Appriss Health with New Tool in the Fight Against the Opioid Crisis



Statewide Opioid Assessment

- Appriss Health's Statewide Opioid Assessment provides state PDMP administrators valuable information on trends and patterns on a state's opioid usage. The Assessment examines patient-level and aggregate trends of controlled-substance prescriptions and overdose deaths within the state. Together, these statistics provide powerful insights into specific prescribing trends and risk factors for overdose death and helps identify communities most affected by the opioid epidemic.
- Michigan was one of the first states in the country to provide all PDMP users in the state access to NarxCare. NarxCare is a substance use disorder prevention and management platform developed by Appriss Health that includes an Overdose Risk Score, which predicts overdose death. The combination of the Statewide Opioid Assessment and the Overdose Risk Score contained in NarxCare both enables state administrators, policy makers, and public health officials to understand trends and over 150,000 providers to quickly assess a patient's PDMP history and risk of overdose death at a glance.

Prescription Drug Crisis in Michigan



While the number of patients using Schedule II-IV drugs and the number dispensations has been stabilizing or decreasing, the number of deaths are increasing

Source: Michigan PDMP 2013-2016 and Michigan 2013-2015 all state-recorded drug-overdose deaths.

General Statistics

Michigan PDMP Data for Prescriptions Written and Medications Dispensed between 2012 and 2017 Drug-Related Deaths between 2013 and 2015

	N	%
Patients	7,575,033	
Patients Who Died (Drug-Related) ¹	5,261	0.09
Patients With History of Receiving an Opioid Narcotic (including MAT)	6,414,174	84.68
Patients With History of Receiving a Sedative	2,849,423	37.62
Patients With History of Receiving Buprenorphine MAT Medication ²	72,780	0.96
Providers³	173,900	
Dispensations	103,214,576	
Dispensations of Opioid Narcotics	53,288,783	51.63
Dispensations of Sedatives	31,028,518	30.06
Prescriptions	84,855,880	
Prescriptions for Opioid Narcotics	47,731,852	56.25
Prescriptions for Sedatives	20,954,308	24.69
National Drug Codes (NDCs)	6,994	
NDCs for Opioid Narcotics	2,646	37.83
NDCs for Sedatives	1,663	23.78

Source: Michigan PDMP Oct. 23, 2012-Oct. 23, 2017 and Michigan 2013-2015 drug-related deaths

Abbreviations: MAT: Medication-Assisted Treatment

Note: DEA number used to identify unique prescribers

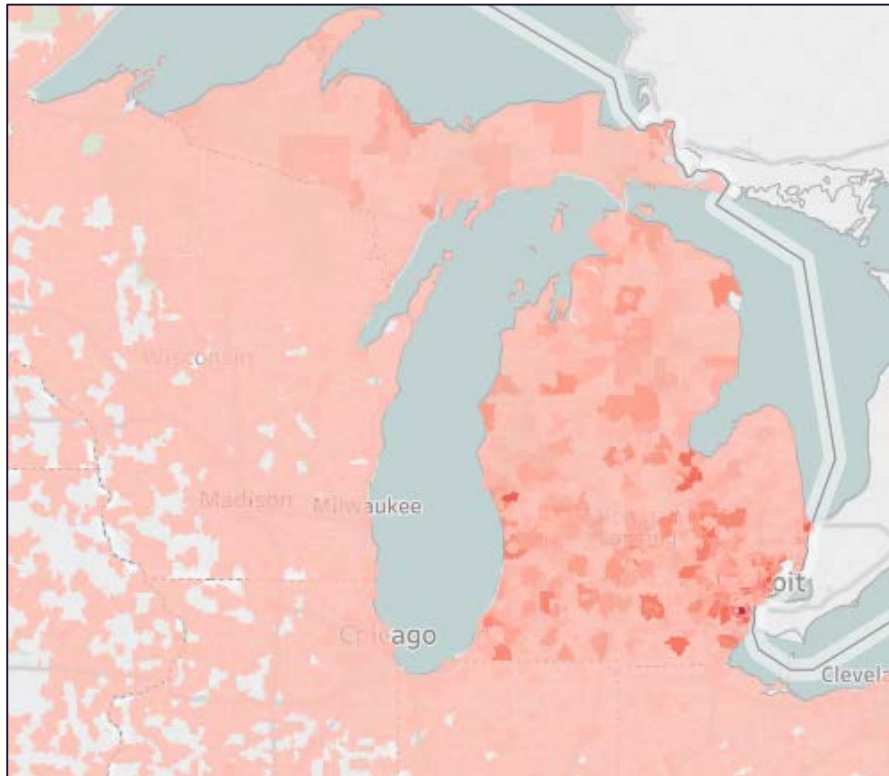
¹Number of deaths are only deaths from 2013-2015 identified by the state of Michigan as drug-related regardless of whether the individual was linked to a PDMP prescription. The denominator is the number of patients with a prescription during 2013-2015 (N=5,903,135).

²Buprenorphine Medication Assisted Therapy (MAT) includes all medication dispensations for NDCs falling under specific Generic Code Numbers (GCNs), including off-label use.

³Providers may have more than one DEA registration number.

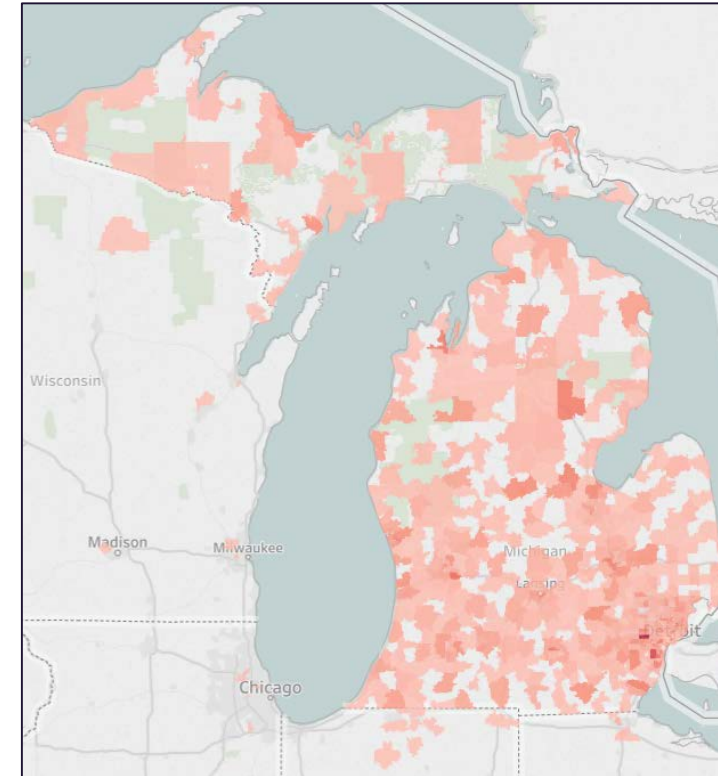
Narcotic and Sedative Prescription Volume by Location

By Patient Zip Code



Darker colors represent higher prescription volumes

By Dispenser Zip Code



Only includes dispensers with at least 20 fills

- 96.7% of patients in the PDMP database have Michigan addresses
- 3.3% of patients have addresses in other states
- The majority (89.9%) of dispensers are located in Michigan

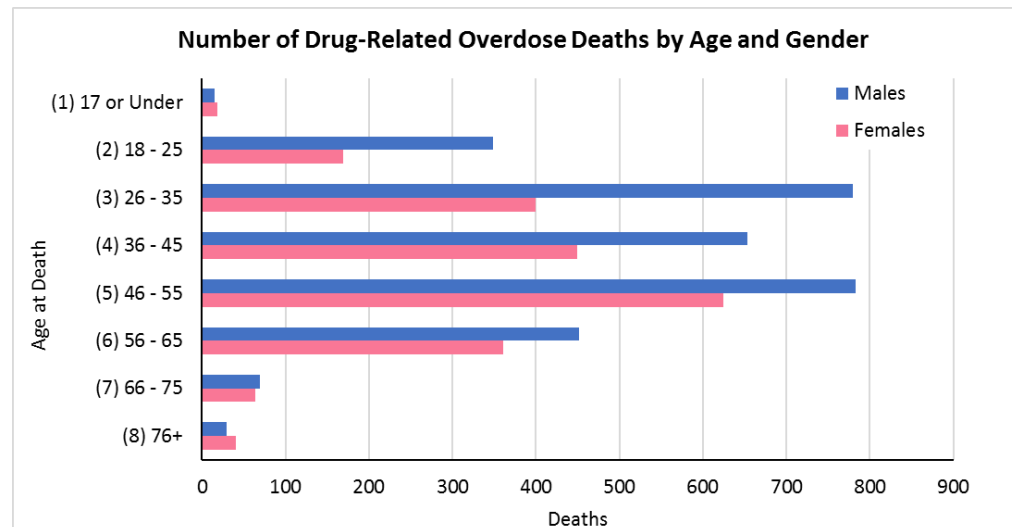
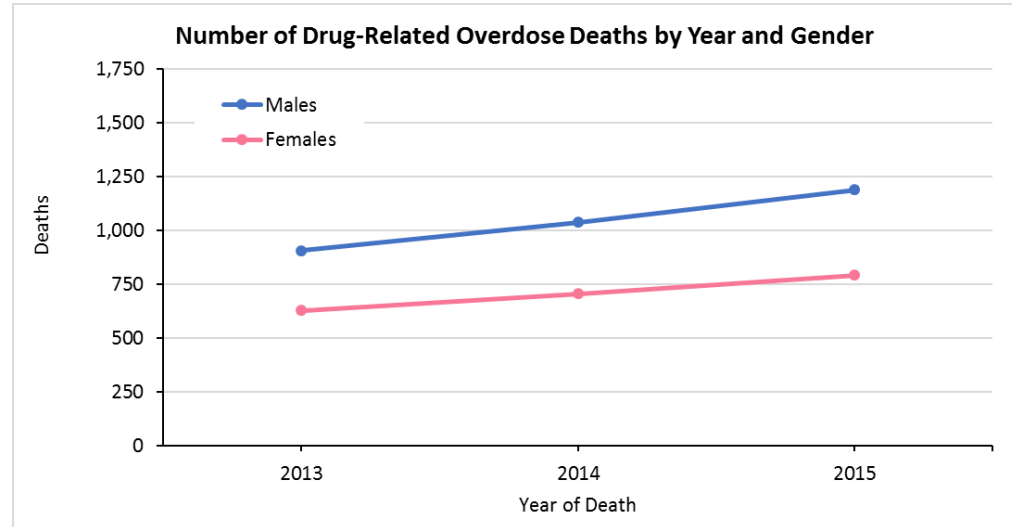
Patient Characteristics

Death Data

There were 30% more drug-related overdose deaths in 2015 than in 2013

The largest number of drug-related overdose deaths occurred among men aged 26-35 and men aged 46-55

Among women, the largest number of drug-related overdose deaths were in the 46-55 age group



Source: Michigan drug-overdose death data 2013-2015

Top Cities – All Years



Top 10 Cities by Drug-Related Overdose Death Rate

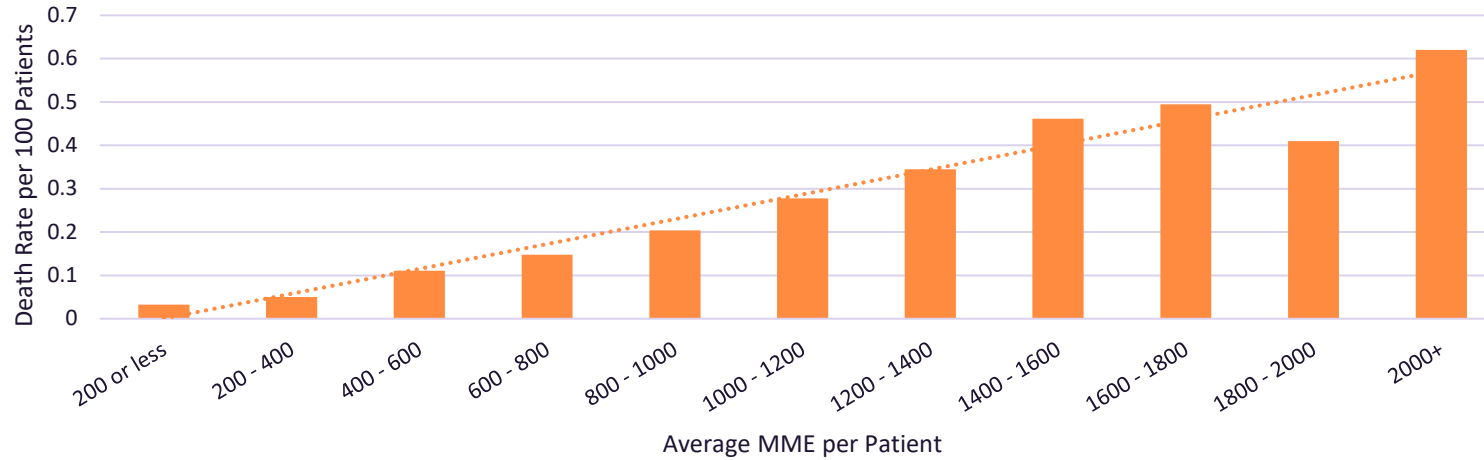
City	Deaths per 1,000 Patients	Deaths
LINCOLN PARK	3.281	97
ECORSE	3.168	23
NEW BALTIMORE	3.151	33
ROMULUS	2.828	65
WYANDOTTE	2.770	55
WOODHAVEN	2.679	25
ROSEVILLE	2.603	92
FLAT ROCK	2.523	34
SOUTHGATE	2.519	58
WAYNE	2.456	37
MOUNT CLEMENS	2.365	29

Top 10 Cities by Number of Drug-Related Overdose Deaths

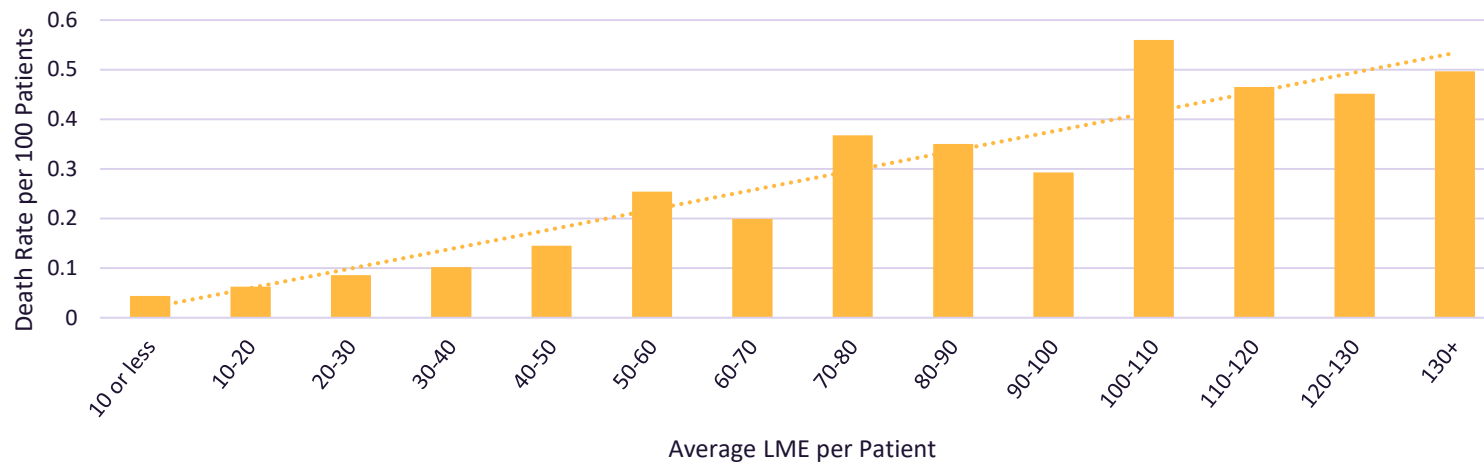
City	Deaths per 1,000 Patients	Deaths
DETROIT	1.198	447
GRAND RAPIDS	0.710	138
WESTLAND	2.206	133
WARREN	1.374	131
LANSING	1.194	123
TAYLOR	2.154	104
YPSILANTI	1.791	103
LINCOLN PARK	3.281	97
ROSEVILLE	2.603	92
FLINT	0.778	84
BATTLE CREEK	1.213	79

Death Rate by Average MME/LME of Patients

Drug-Related Overdose Death Rate by Average Narcotic MME



Drug-Related Overdose Death Rate by Average Sedative LME



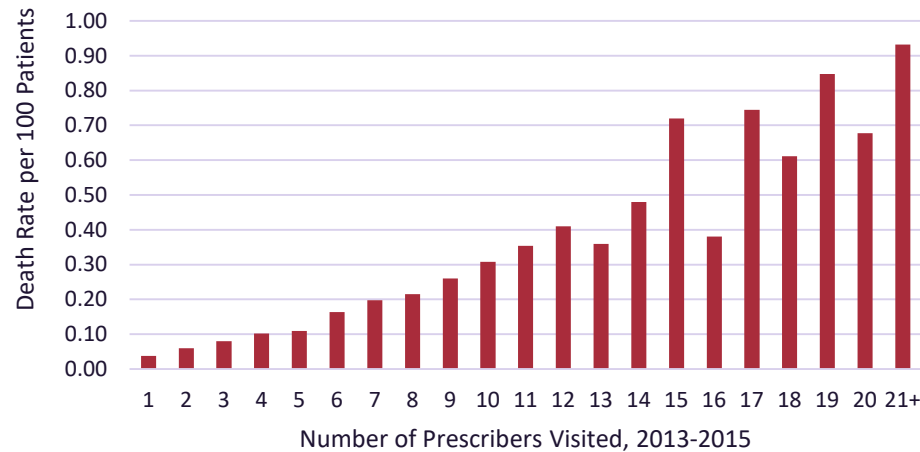
Source: Michigan PDMP Data 2013-2015 and Michigan 2013-2015 drug-related deaths linked to PDMP

Note: Narcotic MME excludes prescriptions classified as Buprenorphine MAT; MME= Number of Pills * Morphine Equivalent Units among Narcotic Prescriptions;

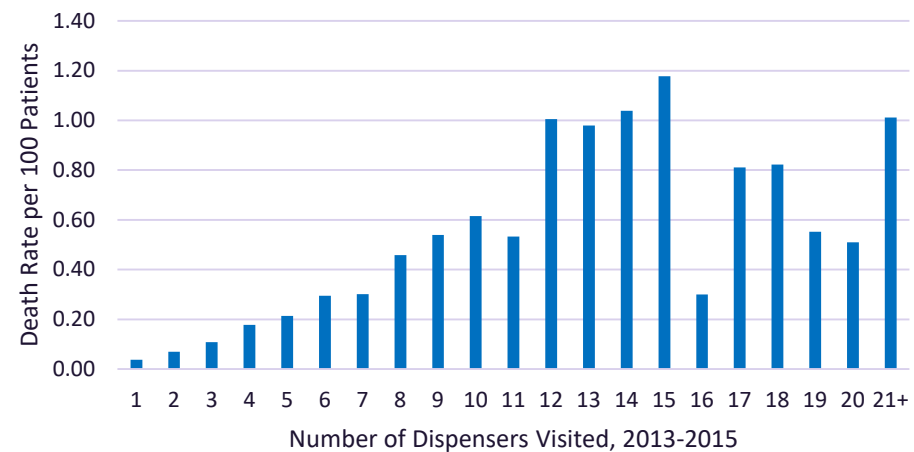
LME= Number of Pills * Lorazepam Equivalent Units among Sedative Prescriptions

Drug-Related Overdose Death Rates by Patient Behavior

Drug-Related Overdose Death Rate by Number of Prescribers Visited

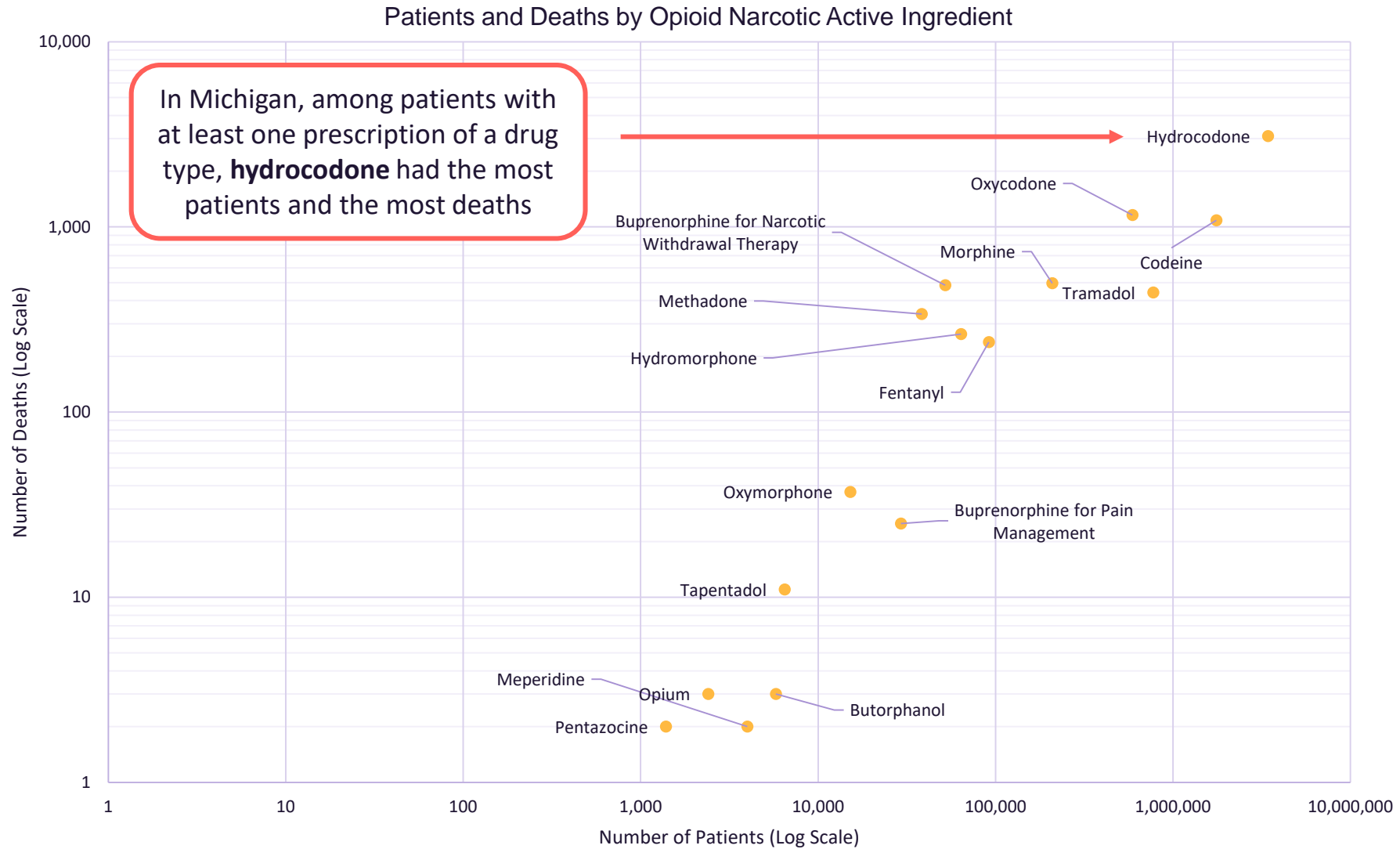


Drug-Related Overdose Death Rate by Number of Dispensers Visited



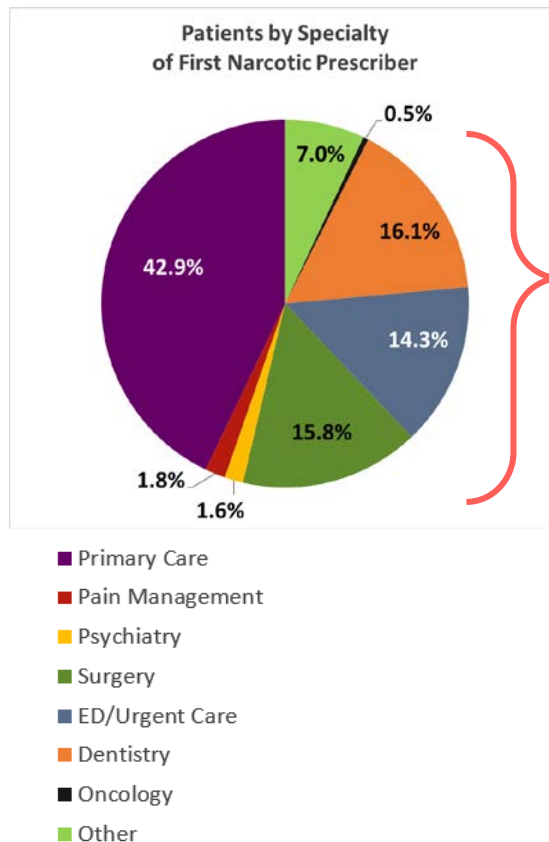
1 out of every 100 patients visiting 21+ prescribers or 21+ dispensers between 2013 and 2015 died

Drug-Related Overdose Deaths by Opioid Narcotic Active Ingredient



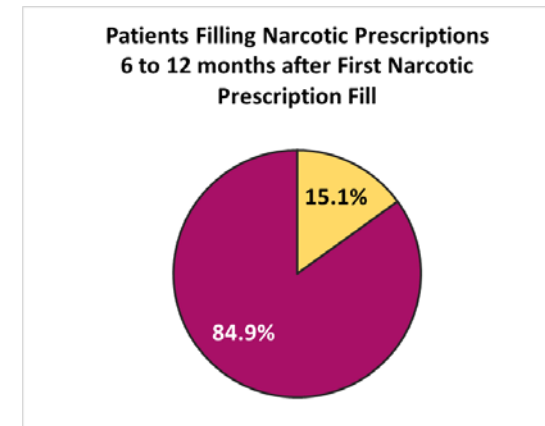
First Narcotic Prescription and Future Use

First narcotic prescription is defined as the first prescription written in 2014 or later for patients who had no fills in 2013 or prior (N=3,586,184 patients)



A large percentage of patients' first narcotic prescription are written in Surgery (15.8%), ED/Urgent Care (14.3%), and Dentistry (16.1%), though these specialties make up 10.2%, 3.6%, and 7.0% of prescribers, respectively

15.1% of patients are still filling narcotic prescriptions 6 months to 1 year after their first narcotic fill

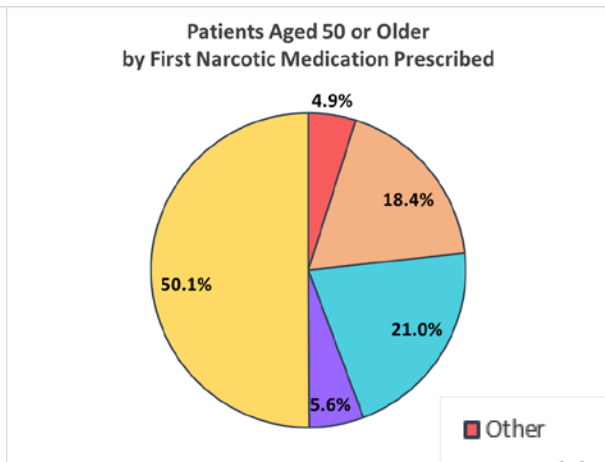
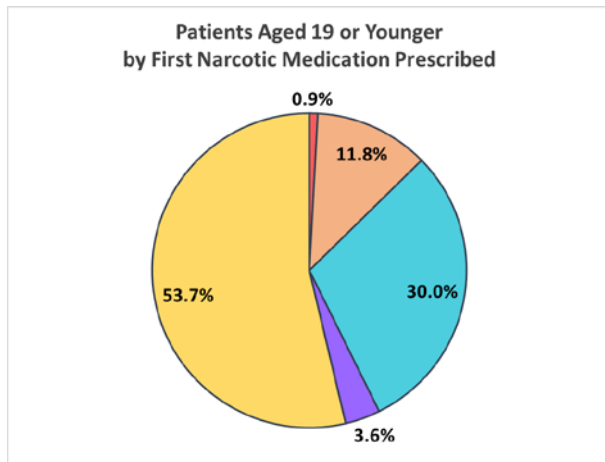
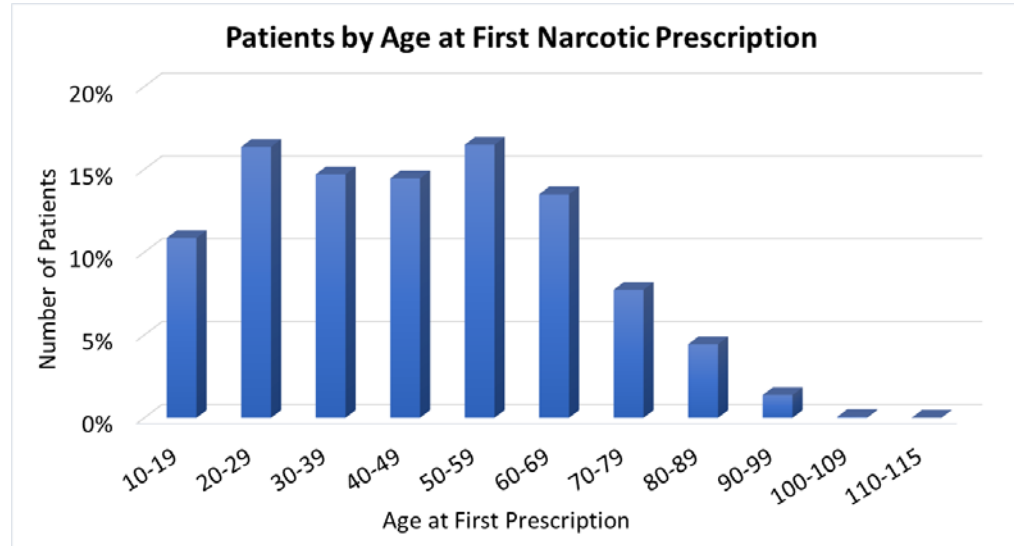


Source: Michigan PDMP Oct. 23, 2012-Oct. 23, 2017, supplemented by NPPES NPI file

Excludes prescribers missing primary specialty classification, Other specialty includes specialties not classified elsewhere; Excludes patients whose first narcotics fill was in 2016, because 1 year of follow-up data not available. Incident narcotic prescriptions were written in 2014 or later; criteria used due to insufficient prescription data prior to 2013.

Patient Age at First Narcotic Prescription

- 45.7 is the average age when patients are written their first narcotic prescription
- 10.9% of patients were first prescribed narcotics before the age of 20 and 27.2% before the age of 30

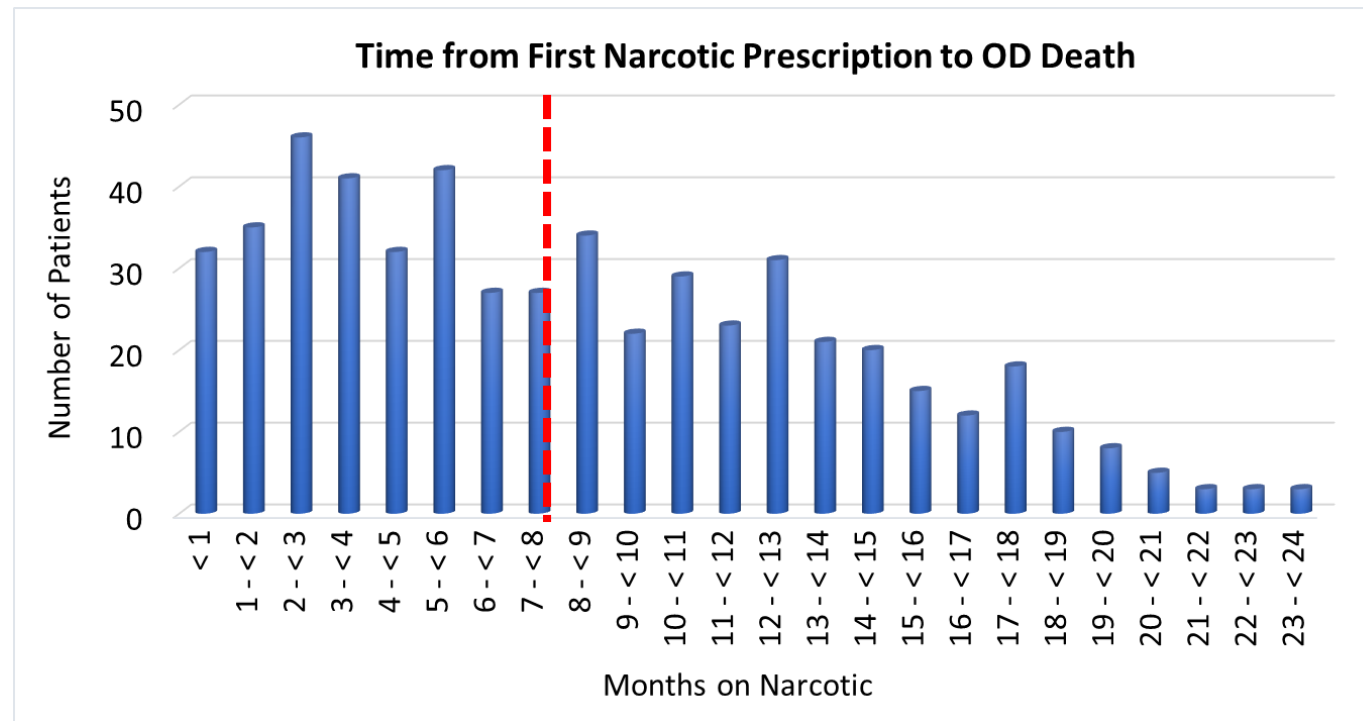


Younger patients (ages <20) are more likely to be prescribed codeine or hydrocodone as their first narcotic than older patients (ages 50+), who are more likely to be prescribed oxycodone, tramadol, or another narcotic

Source: Michigan PDMP Oct. 23, 2012-Oct. 23, 2017
 First narcotic prescriptions were written in 2014 or later; criteria used due to insufficient prescription data prior to 2013
 Excludes patients younger than 10 and older than 115 at their incident prescription.

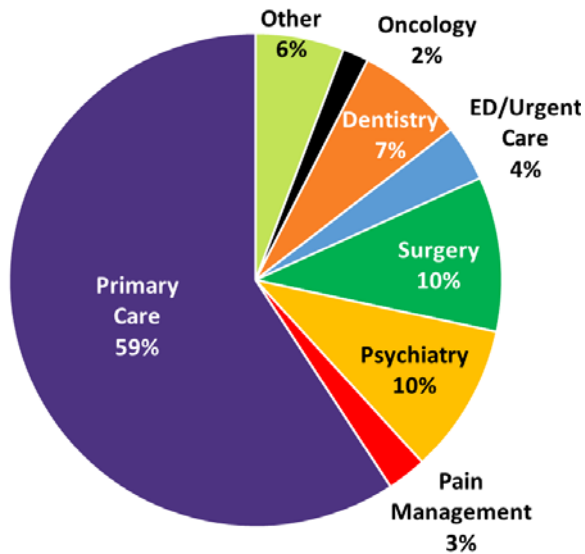
Time from First Narcotic Prescription to OD Death

Among patients whose first narcotic prescriptions were written between 2014 and 2015, those who died of a drug overdose were prescribed narcotics for only 8 months prior to death, on average

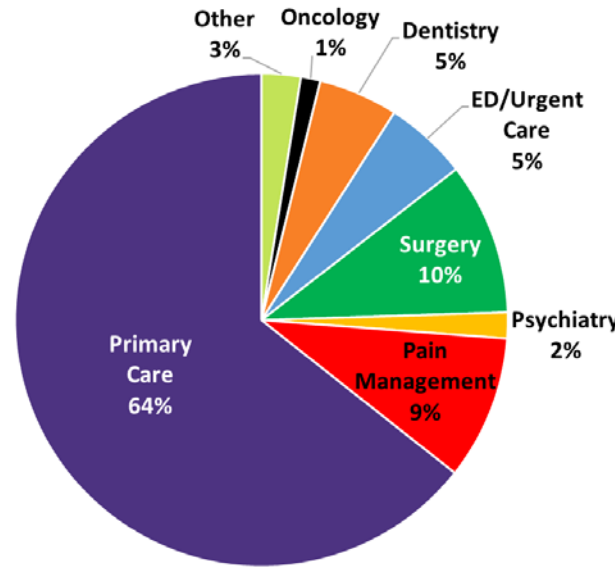


Prescriber Characteristics

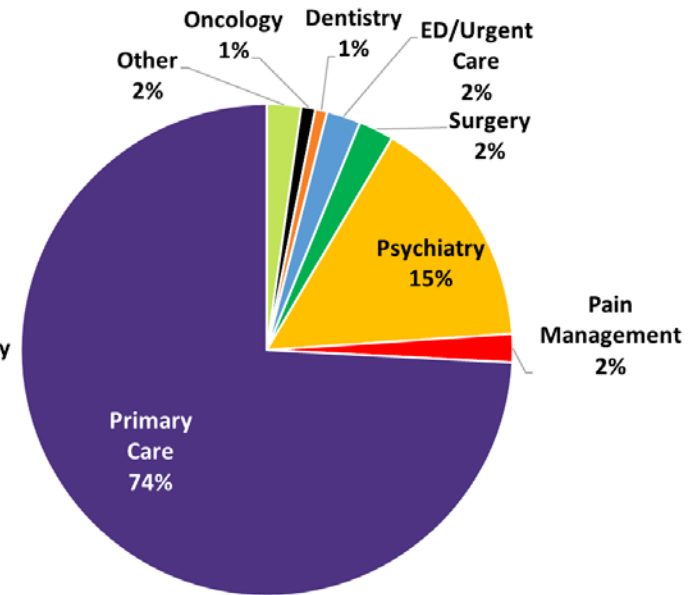
Prescriptions Written by Prescriber Specialty



Number of Prescribers by Specialty



Number of Narcotic Prescriptions by Prescriber Specialty



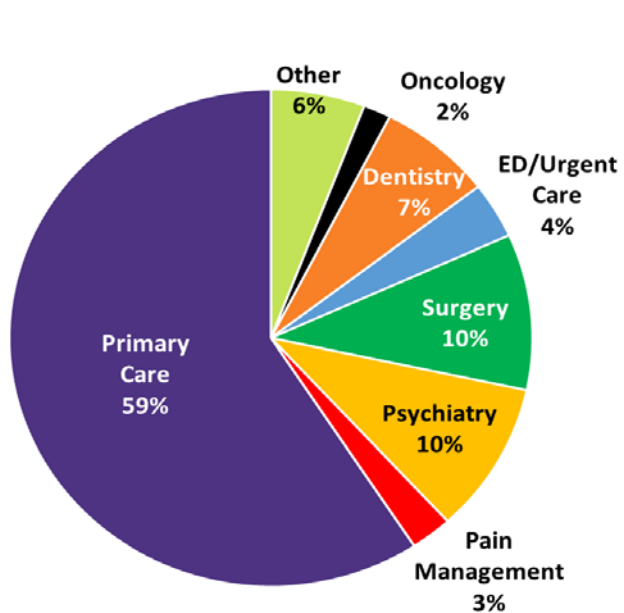
Number of Sedative Prescriptions by Prescriber Specialty

- 59% of prescribers are in **primary care**
- 9% of narcotic prescriptions are written by **pain management** prescribers (3% of all prescribers)
- 15% of sedative prescriptions are written by **psychiatry** prescribers (10% of all prescribers)

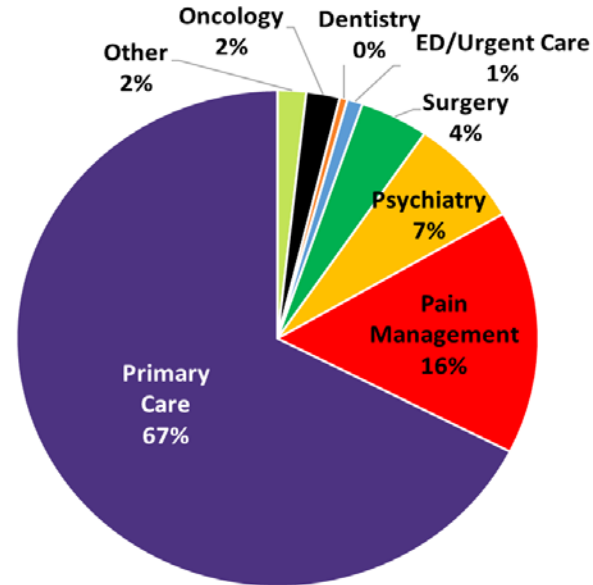
Source: Michigan PDMP Oct. 23, 2012-Oct. 23, 2017 supplemented by NPPES NPI file

Note: Narcotic prescriptions exclude prescriptions classified as Buprenorphine MAT. Prescribers are characterized by their primary specialty. Excludes prescribers missing primary specialty classification. Other specialty includes specialties not classified elsewhere.

Morphine Milligram Equivalency (MME) by Prescriber Specialty



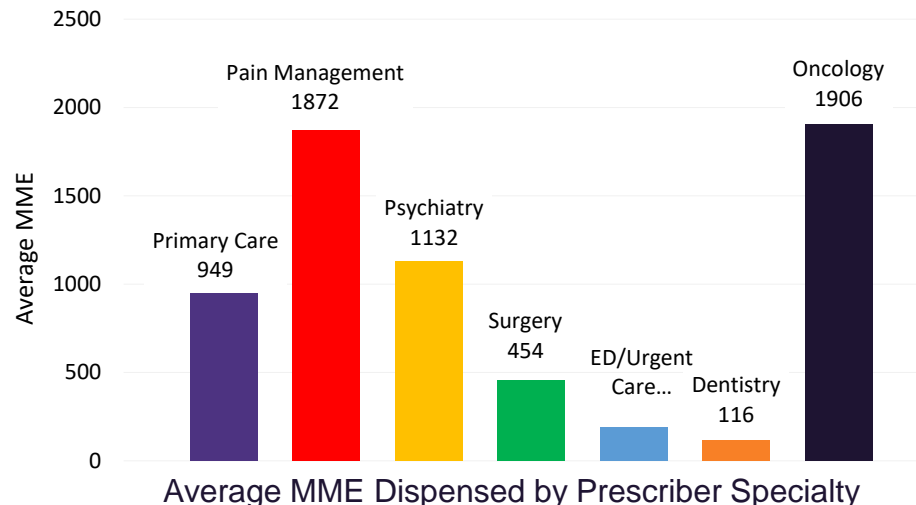
Number of Prescribers by Specialty



Aggregate MME of Prescription Fills by Prescriber Specialty

Pain management accounts for 16% of aggregate MMEs dispensed and the average MME per dispensation is 1.97 times that of primary care

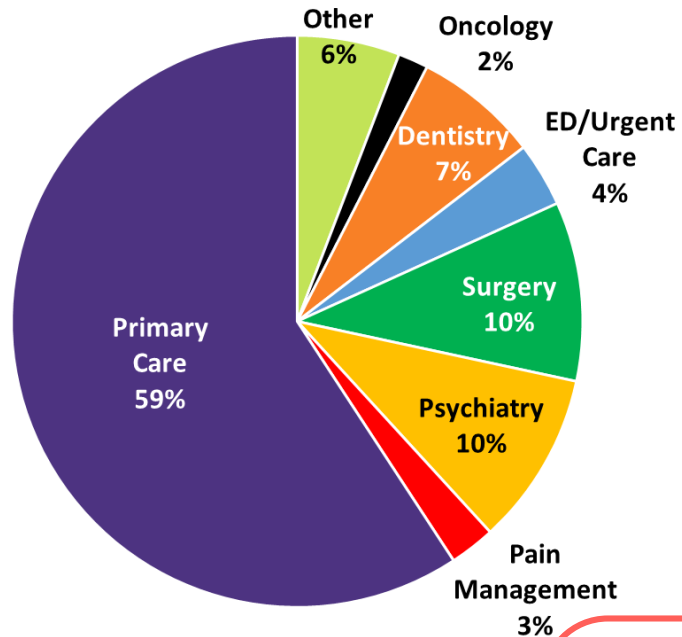
Oncology's average MME per dispensation is twice that of primary care



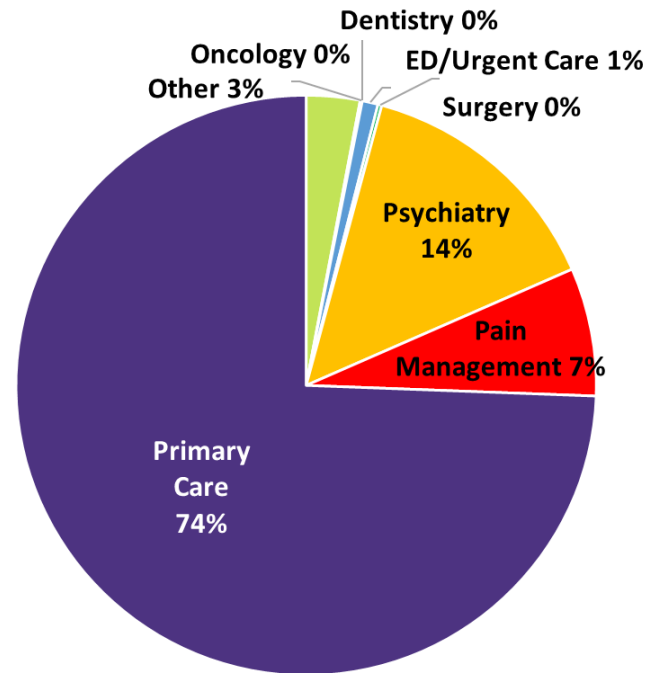
Source: Michigan PDMP Oct. 23, 2012-Oct. 23, 2017 supplemented by NPPES NPI file
 Note: Narcotic prescriptions exclude prescriptions classified as Buprenorphine MAT. Prescribers are characterized by their primary specialty. Narcotic MME excludes prescriptions classified as Buprenorphine MAT; Excludes prescribers missing primary specialty classification; Other specialties include specialties not classified elsewhere; MME= Number of Pills * Morphine Equivalent Units among Narcotic Prescriptions

Buprenorphine MAT by Prescriber Specialty

Number of Prescribers by Specialty



Number of Buprenorphine MAT Prescriptions by Prescriber Specialty



Source: Michigan PDMP Oct. 23, 2012-Oct. 23, 2017 supplemented by NPPES NPI file

Note: Prescribers are characterized by their primary specialty. Excludes prescribers missing primary specialty classification. Other specialty includes specialties not classified elsewhere. Includes only prescriptions classified as Buprenorphine MAT. Buprenorphine Medication Assisted Therapy (MAT) includes all medication dispensations for NDCs falling under specific Generic Code Numbers (GCNs), including off-label use.

- 59% of prescribers are in **primary care**, but primary care writes 74% of the MAT prescriptions
- 7% of MAT prescriptions are written by **pain management** prescribers (3% of all prescribers)
- 14% of MAT prescriptions are written by **psychiatry** prescribers (10% of all prescribers)

Overview of Appriss' Overdose Risk Score

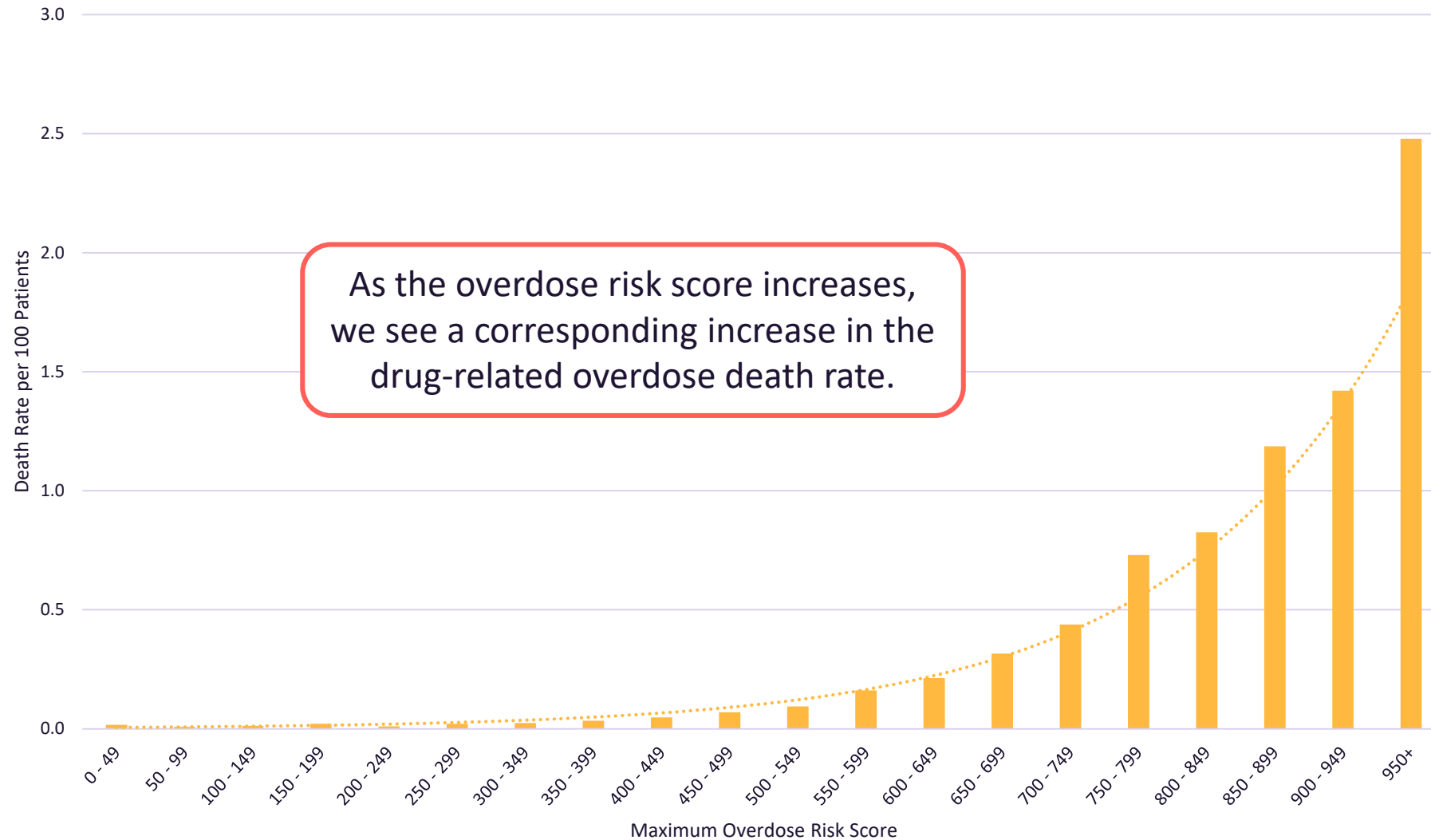
- Appriss has created a proprietary risk score that predicts the likelihood of a drug-related death, taking into account a variety of patient characteristics
- The risk score ranges from 0 to 999
- NarxCare is live today in these states: CT, OH, IN, VA, SC, MI, AZ, CO, NV, ID, WV, & NJ
- NarxCare contracts have been signed in these states and will be implemented soon: TX & PA

Overdose Risk Score Range	Odds Ratio (95% CI)
0-200	Ref.
201-300	1.70 (1.39, 2.06)
301-400	2.68 (2.22, 3.23)
401-500	5.28 (4.39, 6.35)
501-600	11.01 (9.18, 13.20)
601-700	30.20 (24.95, 36.56)
701-800	64.10 (51.97, 79.06)
801-900	55.61 (41.55, 74.43)
901-999	350.83 (211.89, 580.88)

350 times more likely to die of a drug-related death than people with an OD score less than 200

Note: Odds ratios are calculated using case-control sampling. Excludes decedents whose death was prior to 2015, as 2 years of prescription history data not available. For every death, 100 random controls are selected who had a prescription within the year preceding the date of death of the case. For both cases and controls, their maximum overdose risk score within that year period was taken as their exposure.

Drug-Related Overdose Death Rate by Overdose Risk Scores

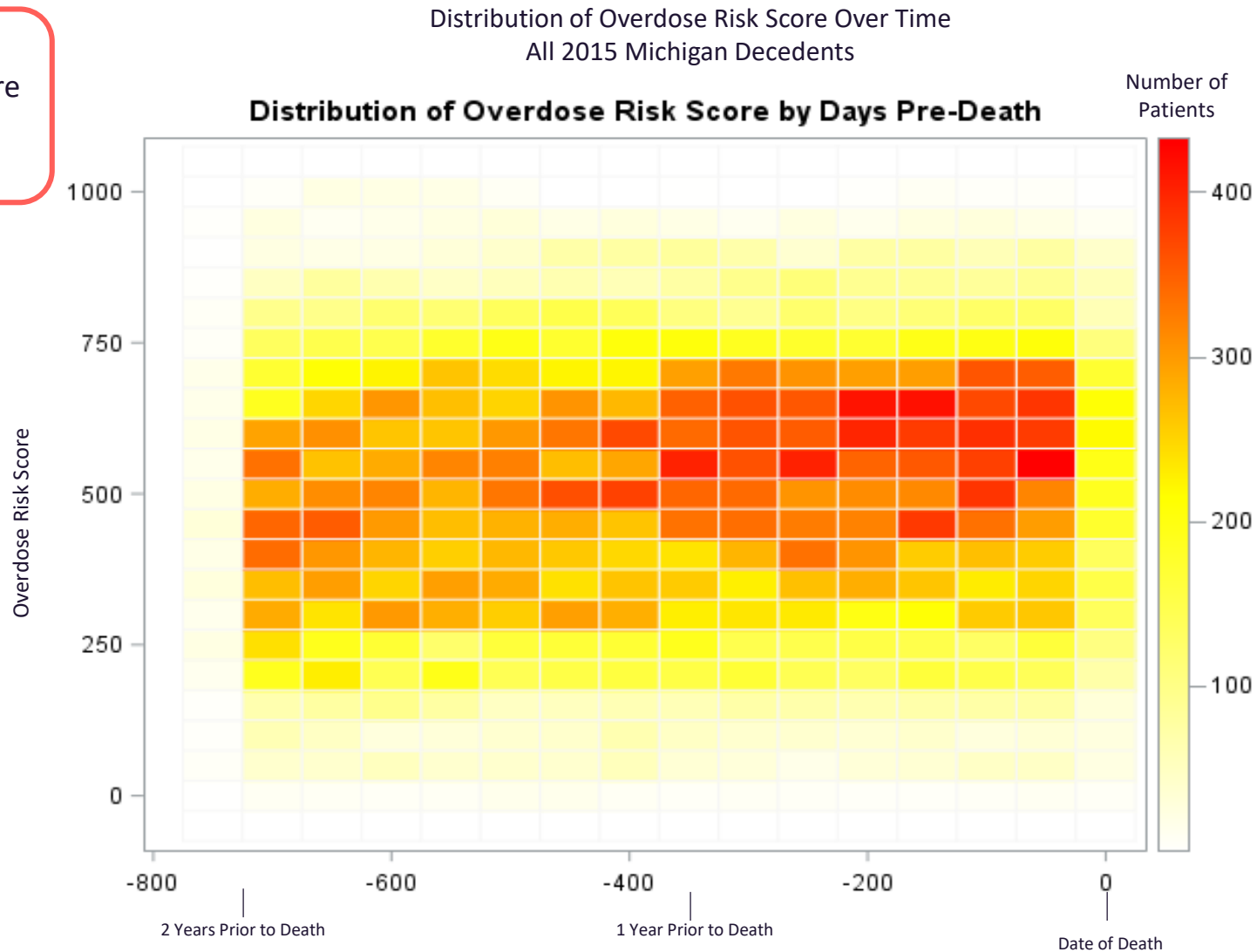


Source: Michigan PDMP 2013-2015 and Michigan 2015 drug-related deaths

Note: Excludes decedents whose death was prior to 2015, because 2 years of prescription history data not available. Overdose Risk Score is the maximum over the entire PDMP history for that patient

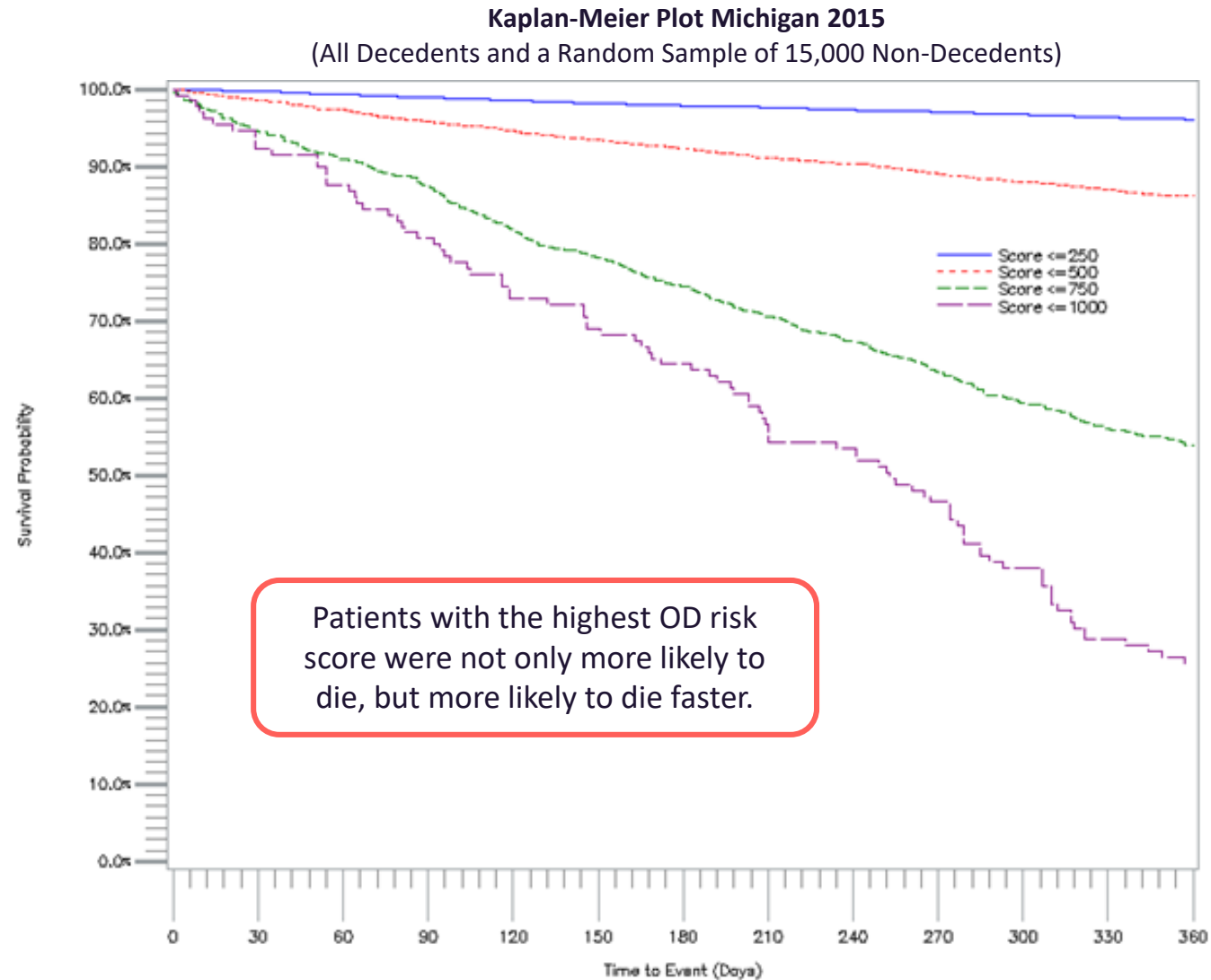
Overdose Risk Score Trends Prior to Death

Patients who died tended to have their highest OD Risk score in the year immediately preceding death



Source: Michigan PDMP 2013-2015 and Michigan 2015 drug-related deaths
Note: Excludes decedents whose death was prior to 2015, because 2 years of prescription history data not available

Overdose Risk Score Kaplan-Meier Plot



Source: Michigan PDMP Oct. 23, 2012-Dec.31, 2014 and Michigan 2015 drug-related deaths

Note: Includes all decedents from 2015 and a random sample of 15,000 non-decedents. Day 0 is Jan 1, 2015. ODS Score is the last score calculated for each patient in 2014. Patients had to have had a fill during 2014.

Questions?

Thank You!



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