APPRISS
HEALTH

Michigan AWARxE/NarxCare Implementation Evaluation

A Roadmap for Success

What Appriss Does Today

Founded in 1994, Appriss provides proprietary data and analytics solutions to address risk, fraud, safety and compliance issues for government and commercial enterprises worldwide.

APPRISS® SAFETY

- **43 Statewide** programs delivering notification and information to crime victims
- Helping thousands of law enforcement to **hold offenders accountable**
- Hundreds of state and federal agencies leverage Appriss data to **make our nation safer** and to prevent criminal fraud

APPRISS® HEALTH

- **46 states** depend on Appriss to deliver interstate information exchange around controlled substances (Opioids)
- **43 states** have outsourced the management of their controlled substance database to Appriss
- Appriss provides the national platform (**50 states**) for preventing diversion of over the counter medicine containing pseudoephedrine

APPRISS® RETAIL

- More than **150,000 retail locations** use Appriss to mitigate fraud at the point of sale
- Many of the top retailers worldwide, **across 35 countries,** use Appriss to prevent loss and improve their bottom line
- Appriss evaluates **billions of transactions daily** as we prevent fraud and abuse within the retail world

Study Overview

- Analysis to assess the impact of AWARxE and NarxCare on Michigan's PDMP.
- Appriss' AWARxE PDMP platform was implemented in Michigan as of 4/4/2017.
  - AWARxE platform allows for a patient's PDMP history to be searched by permitted parties (e.g., prescribers and pharmacists).
- Appriss' NarxCare program was implemented for all of Michigan as of 12/4/2017. NarxCare layers additional patient-level statistics on top of the patient's PDMP history, including a visual record of multiple prescribers, overlapping prescriptions, and patient risk-scores. These are intended to help a prescriber assess patient risk quickly.
- On 6/1/2018, new legislation took effect in Michigan mandating prescribers to utilize the PDMP (MAPS) prior to prescribing Schedules 2-5 controlled substances. This assessment ends 5/31/2018 to limit the mixing of effects with this new legislation.
- Pre-Appriss period was selected to be 2/6/2016 to 4/3/2017 (423 days). The AWARxE period (244 days) and the NarxCare period (179 days) together equal the number of days assessed in the Pre-Appriss period.
- Some metrics, particularly patient risk scores used for NarxCare, assess two years of patient history to give accurate risk scores. Two years prior to the pre-Appriss period were used to calculate those metrics. While plots display the pre-study period, analyses do not include those dates.
- When appropriate, a comparison of two other states using Appriss were used. Neither state had NarxCare as of 5/31/2018. Both had given Appriss sufficient PDMP history to match Michigan's study dates, but had varying dates of using AWARxE.
- 4,891,776 patients filled 47,149,032 controlled substance prescriptions during the assessment.

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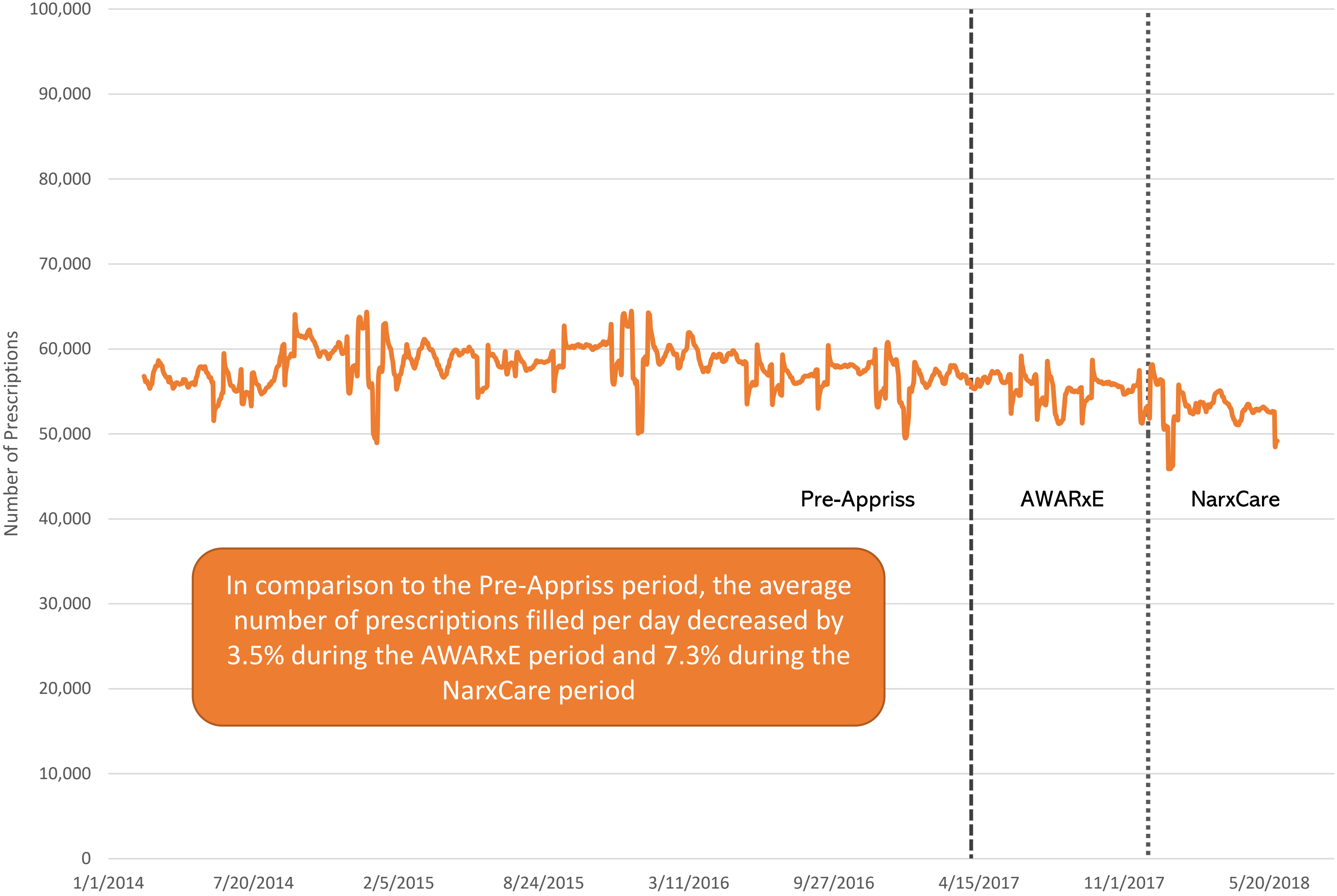
Michigan Controlled Substance Prescriptions Filled

14-Day Rolling Average



In comparison to the Pre-Appriss period, the average number of prescriptions filled per day decreased by 3.5% during the AWARxE period and 7.3% during the NarxCare period

Note: All Michigan MAPS reportable prescriptions filled, no exclusions. Study period February 6, 2016 – May 31, 2018
Pre-Appriss 2/6/2016—4/3/2017; AWARxE 4/4/4017—12/3/2017; NarxCare 12/4/2017—5/31/2018

Michigan Controlled Substance Prescriptions Filled

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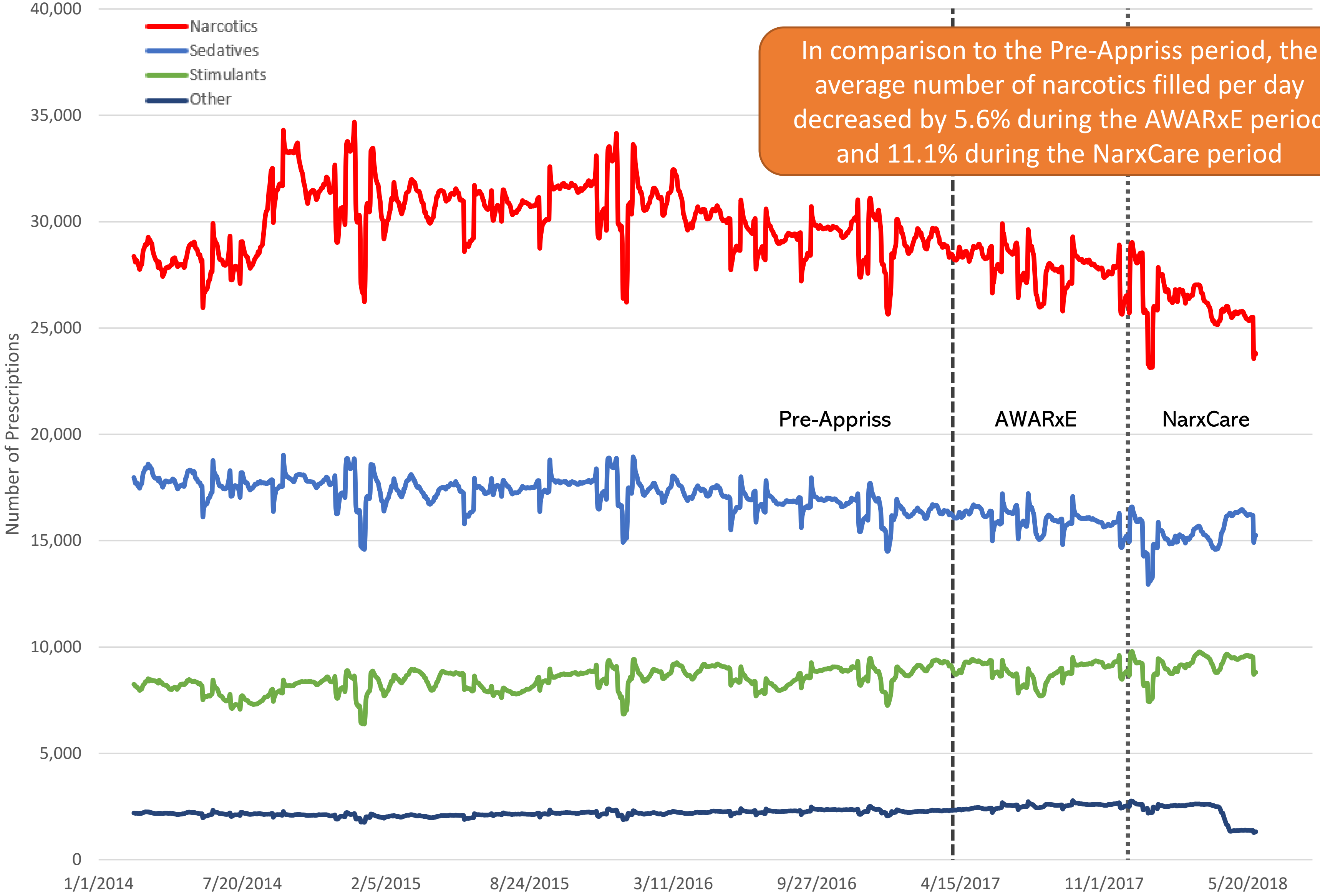

In comparison to the Pre-Appriss period, the average number of narcotics filled per day decreased by 5.6% during the AWARxE period and 11.1% during the NarxCare period

Note: All Michigan MAPS reportable prescriptions filled, no exclusions. Study period February 6, 2016 – May 31, 2018
Pre-Appriss 2/6/2016—4/3/2017; AWARxE 4/4/4017—12/3/2017; NarxCare 12/4/2017—5/31/2018

Rate of Change in Prescription Fills Per Day by Study Period, by Drug Classification

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MICHIGAN

Period	All Dispensations Rate of Change per day	Narcotic Dispensations Rate of Change per day	Sedative Dispensations Rate of Change per Day	Stimulant Dispensations Rate of Change per Day	Other Dispensations Rate of Change per Day
Pre-Appriss	-6.6	-4.5	-2.8	+0.5	+0.3
AWARxE	-11.9	-7.9	-4.5	-0.3	+0.7
NarxCare	-14.8	-14.7	+4.9	+3.1	-8.0

- Prior to AWARxE and NarxCare, the number of controlled substance prescriptions filled was decreasing.
- The decline in the number of narcotic prescriptions filled accelerated with the implementation of AWARxE.
- With NarxCare, Michigan is filling on average 14.7 fewer narcotic prescriptions each day, 3x the rate in the Pre-Appriss period.
- While the rate of sedative prescription fills has increased during NarxCare, this is due to Appriss re-classifying pregabalin as a sedative instead of “other.”

Note: All Michigan MAPS reportable prescriptions filled, no exclusions. Study period February 6, 2016 – May 31, 2018
Pre-Appriss 2/6/2016—4/3/2017; AWARxE 4/4/4017—12/3/2017; NarxCare 12/4/2017—5/31/2018

Percent Change in Average Number of Prescriptions Filled per Day, by Drug Classification

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Period	**All Prescriptions**		**Narcotics**		**Sedatives**		**Stimulants**		**Other Prescriptions**	
	Average per day	Percent Change MI	Average per day	Percent Change MI	Average per day	Percent Change MI	Average per day	Percent Change MI	Average per day	Percent Change MI
Pre-Appriss	57,192	--	29,468	--	16,743	--	8,715	--	2,266	--
AWARxE	55,179	-3.5%	27,826	-5.6%	15,958	-4.7%	8,873	1.8%	2,522	11.3%
NarxCare	53,035	-7.3%	26,200	-11.1%	15,434	-7.8%	9,190	5.5%	2,211	-2.5%

- In comparison to the Pre-Appriss period, the average number of prescriptions dispensed per day decreased by 3.5% during the AWARxE period and 7.3% during the NarxCare period.
- There was a greater decline of narcotics dispensed, at 5.6% during the AWARxE period and 11.1% during the NarxCare period.

Note: All Michigan MAPS reportable prescriptions filled, no exclusions. Study period February 6, 2016 – May 31, 2018
Pre-Appriss 2/6/2016—4/3/2017; AWARxE 4/4/4017—12/3/2017; NarxCare 12/4/2017—5/31/2018

Percent of Patients Filling Narcotic Prescriptions Per Day

7-Day Rolling Average

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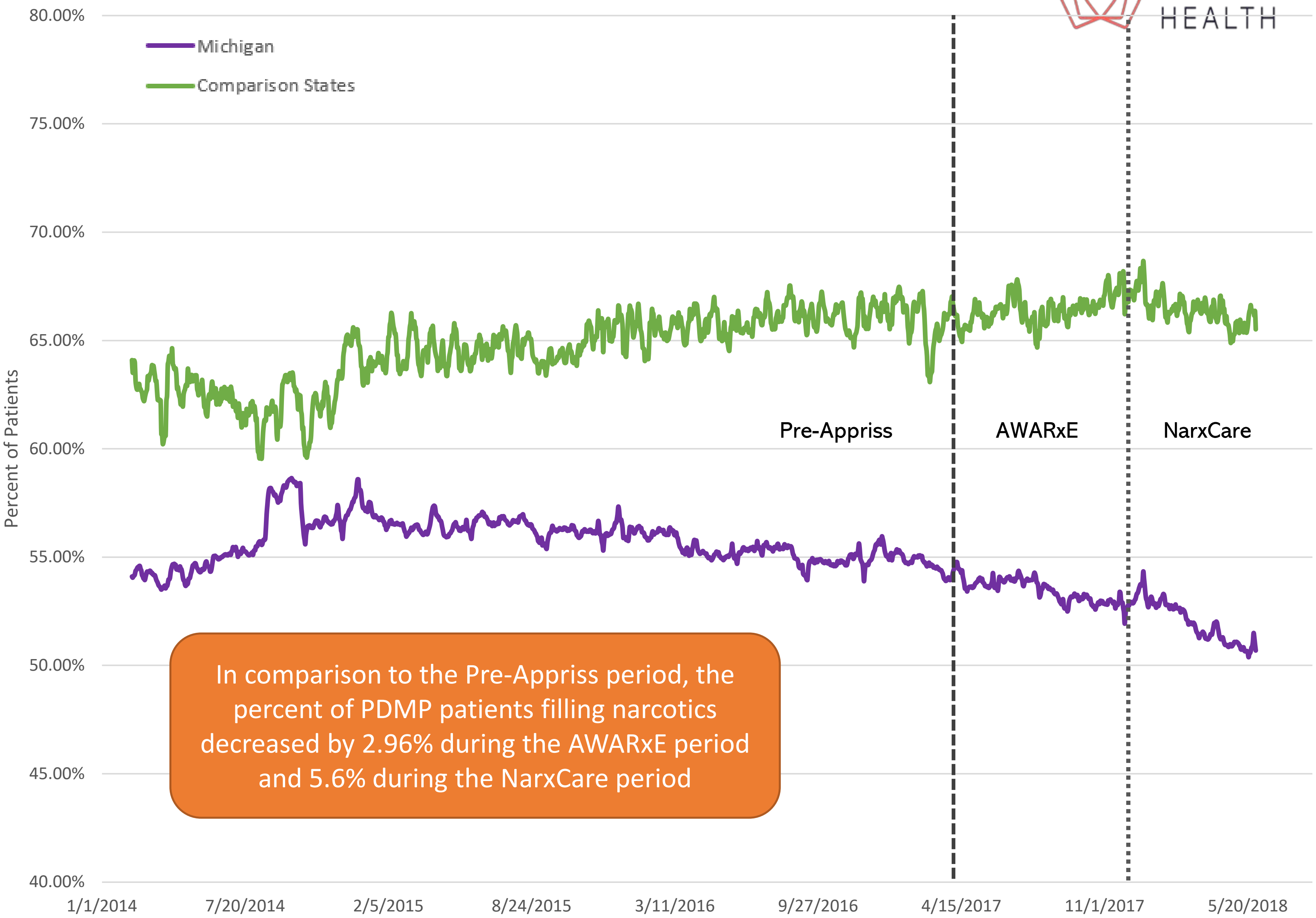

In comparison to the Pre-Appriss period, the percent of PDMP patients filling narcotics decreased by 2.96% during the AWARxE period and 5.6% during the NarxCare period

Note: All Michigan MAPS reportable and comparison state PDMP reportable prescriptions filled, no exclusions. Study period February 6, 2016 – May 31, 2018
Pre-Appriss 2/6/2016—4/3/2017; AWARxE 4/4/4017—12/3/2017; NarxCare 12/4/2017—5/31/2018

Change in the Percent of Patients Filling Narcotic Prescriptions by Study Period

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Period	Average Daily Percent MI	Average Daily Percent Comparison States	Change MI	Change Comparison States	Difference	Rate of Change per Day MI	Rate of Change per Day Comparison States	Difference
Pre-Appriss	55.1%	66.0%	--	--	--	-0.003%	0.001%	-0.004%
AWARxE	53.5%	66.4%	-3.0%	0.7%	-3.6%	-0.006%	0.005%	-0.011%
NarxCare	52.0%	66.4%	-5.6%	0.7%	-6.3%	-0.017%	-0.009%	-0.008%

- The percentage of the PDMP patient population who filled narcotics decreased from 55.1% to 52.0%.
- Michigan’s PDMP patients are less likely to fill narcotics compared to the comparison states.
- The rate of change in the percent of PDMP patients filling narcotic prescriptions each day has accelerated over time. The rate of change per day doubled during the AWARxE period compared to the Pre-Appriss period, and then nearly tripled during the NarxCare period when compared to the AWARxE period.

Note: All Michigan MAPS reportable and comparison state PDMP reportable prescriptions filled, no exclusions. Study period February 6, 2016 – May 31, 2018
Pre-Appriss 2/6/2016—4/3/2017; AWARxE 4/4/4017—12/3/2017; NarxCare 12/4/2017—5/31/2018

Prescriptions to Abusive Patients

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An “Abusive” Patient is identified as being in the top 10th percentile for five characteristics during the two years prior to the study start (2/6/2014-2/5/2016).

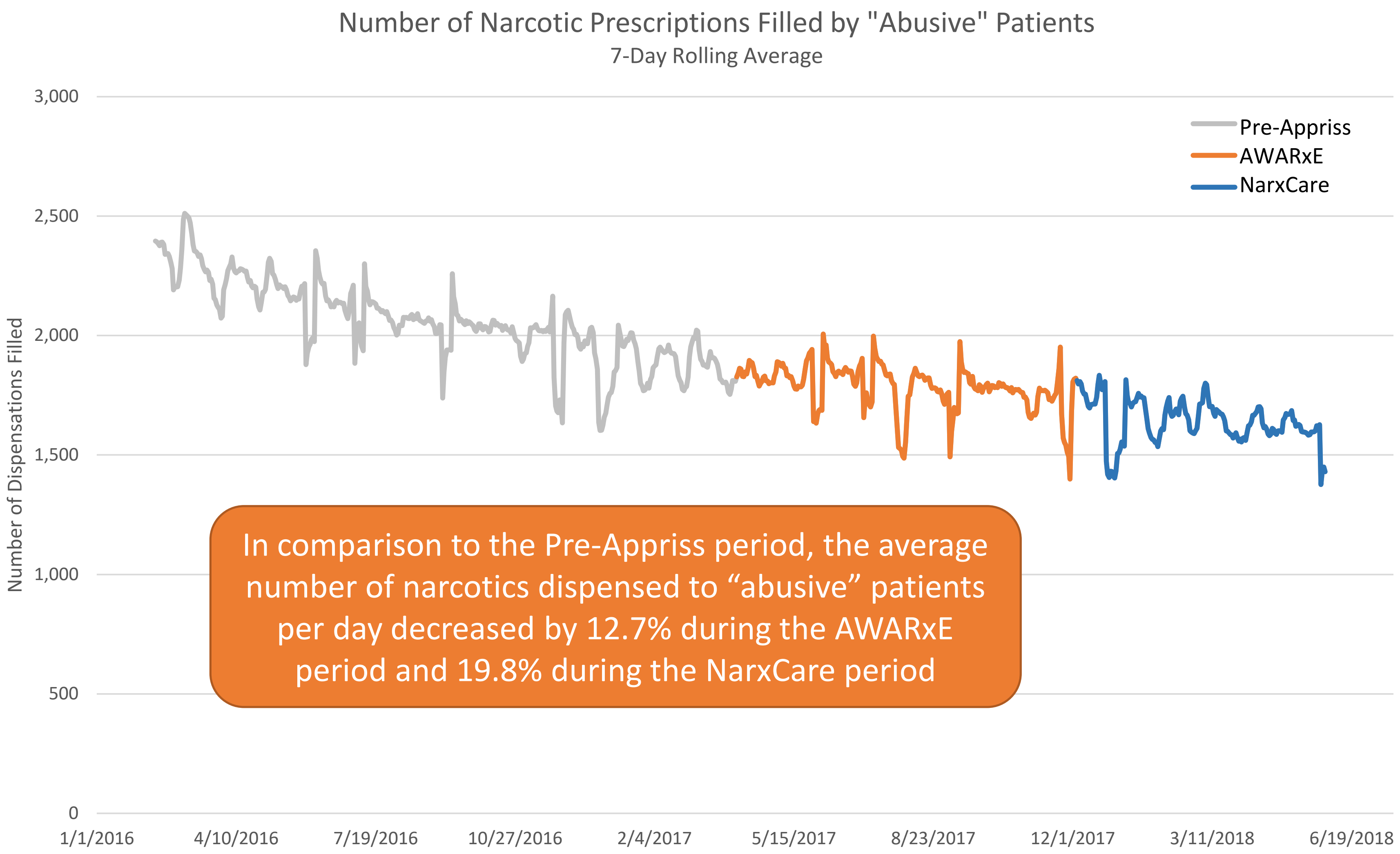
The top 10th percentile cut points for each of the five characteristics over a two year period are as follows:

1. Patient filled 24 or more narcotic prescriptions
2. Patient filled 5 or more narcotic prescriptions each written by different prescribers
3. Patients filled 3 or more narcotic prescriptions at different dispensers
4. Patient filled 630 or more days-supply of narcotic prescriptions
5. Patient filled 20,340 MME units of narcotic prescriptions

If a patient met or exceeded all five of the criteria, they were identified as “abusive.” Out of 2,558,021 patients who filled at least one prescription during the two years prior to the Pre-Appriss period, 42,909 patients were identified as “abusive.”

Note: All Michigan MAPS reportable prescriptions filled, no exclusions. Study period February 6, 2016 – May 31, 2018
Pre-Appriss 2/6/2016—4/3/2017; AWARxE 4/4/4017—12/3/2017; NarxCare 12/4/2017—5/31/2018

Narcotic Dispensations to Abusive Patients



In comparison to the Pre-Appriss period, the average number of narcotics dispensed to "abusive" patients per day decreased by 12.7% during the AWARxE period and 19.8% during the NarxCare period

Note: All Michigan MAPS reportable prescriptions filled, only patients identified as "abusive". Study period February 6, 2016 – May 31, 2018
Pre-Appriss 2/6/2016—4/3/2017; AWARxE 4/4/4017—12/3/2017; NarxCare 12/4/2017—5/31/2018

Following the Cohort of 42,909 “Abusive” Patients

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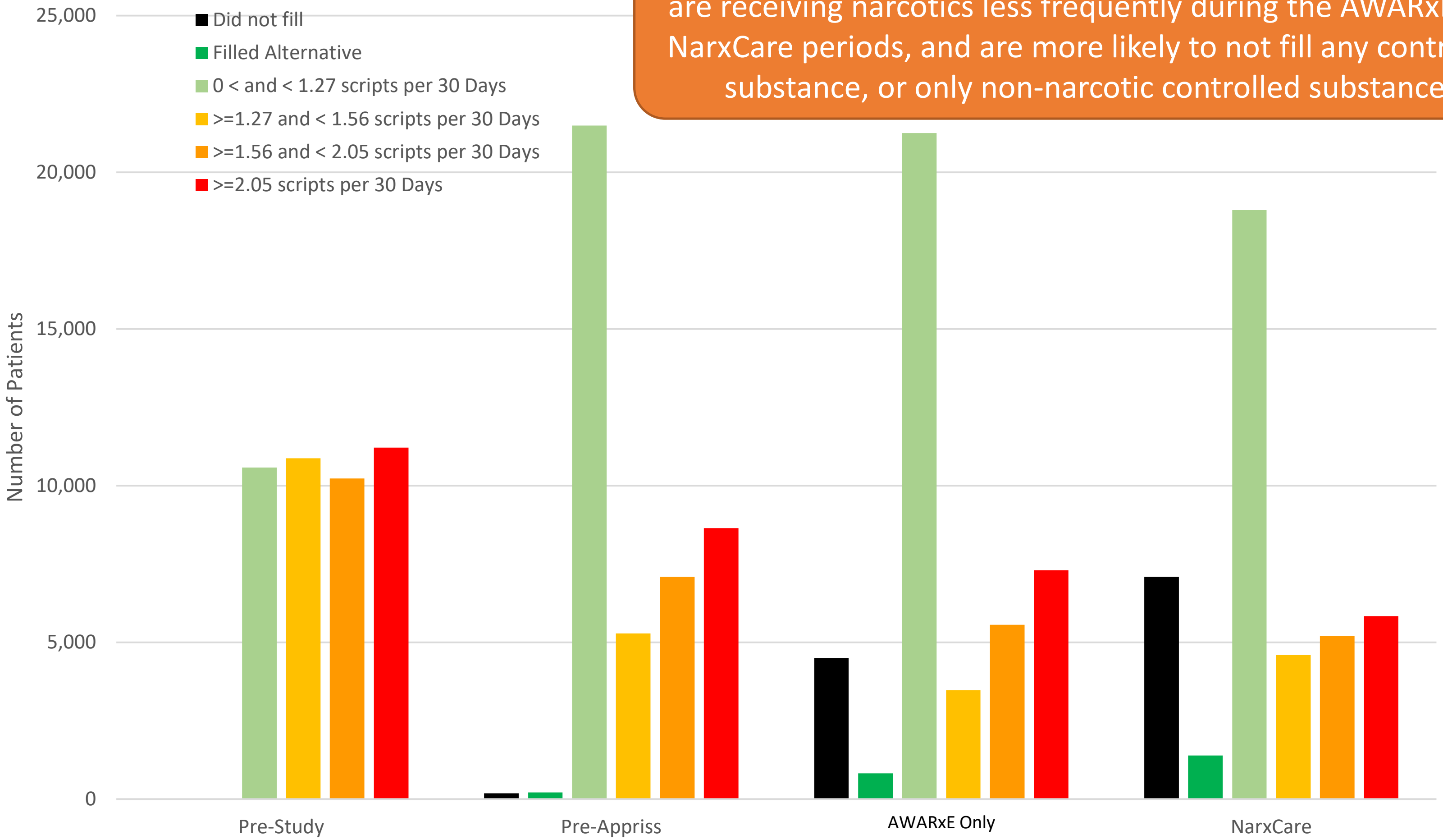
In comparison to the Pre-Appriss period, “abusive” patients are receiving narcotics less frequently during the AWARxE and NarxCare periods, and are more likely to not fill any controlled substance, or only non-narcotic controlled substances



Notes: “Abusive” Patients defined by being in the top 10 percent of patients for 5 prescription characteristics (see definition on slide X), including filling 24 or more narcotic prescriptions during the Pre-Study period. How often the patient fills narcotic prescriptions is calculated by summing the total number of prescriptions filled in the period, and dividing by the number of days in the period, then multiplied by 30 to standardize to 30 days. Cut points were selected as the 25th, 50th, and 75th percentiles of how often prescriptions were filled during the Pre-Study Period.

Note: All Michigan MAPS reportable prescriptions filled, only patients identified as “abusive”. Study period February 6, 2016 – May 31, 2018
Pre-Appriss 2/6/2016—4/3/2017; AWARxE 4/4/4017—12/3/2017; NarxCare 12/4/2017—5/31/2018

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Year/Month	Days In Each Month	Count of Abusive Dispensations	Abusive Dispensations Adjusted for Number of Days in Month	Change in Abusive Dispensations
2016/2	24	79,333	99,166	
2016/3	31	107,635	104,163	6.7%
2016/4	30	99,372	99,372	3.2%
2016/5	31	98,182	95,015	0.3%
2016/6	30	99,315	99,315	4.8%
2016/7	31	93,558	90,540	-5.0%
2016/8	31	97,693	94,542	-1.7%
2016/9	30	93,153	93,153	-2.4%
2016/10	31	90,067	87,162	-7.9%
2016/11	30	89,470	89,470	-6.2%
2016/12	31	88,094	85,252	-9.0%
2017/1	31	86,268	83,485	-10.3%
2017/2	28	79,283	84,946	-9.4%
2017/3	31	88,743	85,880	-5.3%
2017/4	30	79,139	79,139	-13.2%
2017/5	31	86,121	83,343	-6.3%
2017/6	30	85,822	85,822	-1.8%
2017/7	31	78,765	76,224	-14.0%
2017/8	31	84,715	81,982	-7.4%
2017/9	30	79,275	79,275	-10.2%
2017/10	31	80,590	77,990	-12.6%
2017/11	30	78,549	78,549	-10.9%
2017/12	31	75,297	72,868	-16.1%
2018/1	31	76,790	74,313	-14.2%
2018/2	28	69,971	74,969	-12.2%
2018/3	31	76,270	73,810	-14.1%
2018/4	30	71,925	71,925	-17.2%
2018/5	31	74,903	72,487	-14.1%

Pre-Appriss
February 6,2016 – April 3, 2017

AWARxE
April 4,2017 – December 3, 2017

NarxCare
December 3, 2017 – May 31, 2018

Note: All Michigan MAPS reportable prescriptions filled, only patients identified as “abusive”. Study period February 6, 2016 – May 31, 2018
Pre-Appriss 2/6/2016—4/3/2017; AWARxE 4/4/4017—12/3/2017; NarxCare 12/4/2017—5/31/2018

Abusive Patients by Study Period

Time Period	Dates	Num. of Narcotic Dispensations to “Abusive” Patients	Num. of Narcotic Dispensations to “Abusive” Patients per Day	Reduction to Narcotic Dispensations to “Abusive” Patients per day
Period 1: Pre-Appriss	2/6/2016 – 4/3/2017	1,296,137	3,064	--
Period 2: AWARxE Only	4/4/2017 – 12/3/2017	652,529	2,674	-12.7%
Period 3: NarxCare	12/4/2017 – 5/31/2018	439,632	2,456	-19.8%

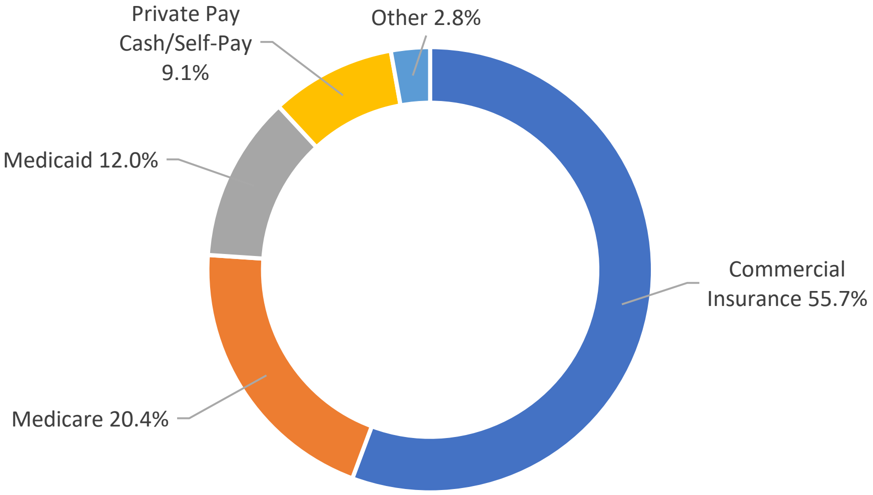
- In comparison to the Pre-Appriss period, the average number of narcotic prescriptions received by “abusive” patients per day decreased 12.7% during the AWARxE period, and decreased by 19.8% during the NarxCare period.

Note: All Michigan MAPS reportable prescriptions filled, only patients identified as “abusive”. Study period February 6, 2016 – May 31, 2018
Pre-Appriss 2/6/2016—4/3/2017; AWARxE 4/4/4017—12/3/2017; NarxCare 12/4/2017—5/31/2018

Multiple Sources of Payment for Controlled Substance Prescriptions

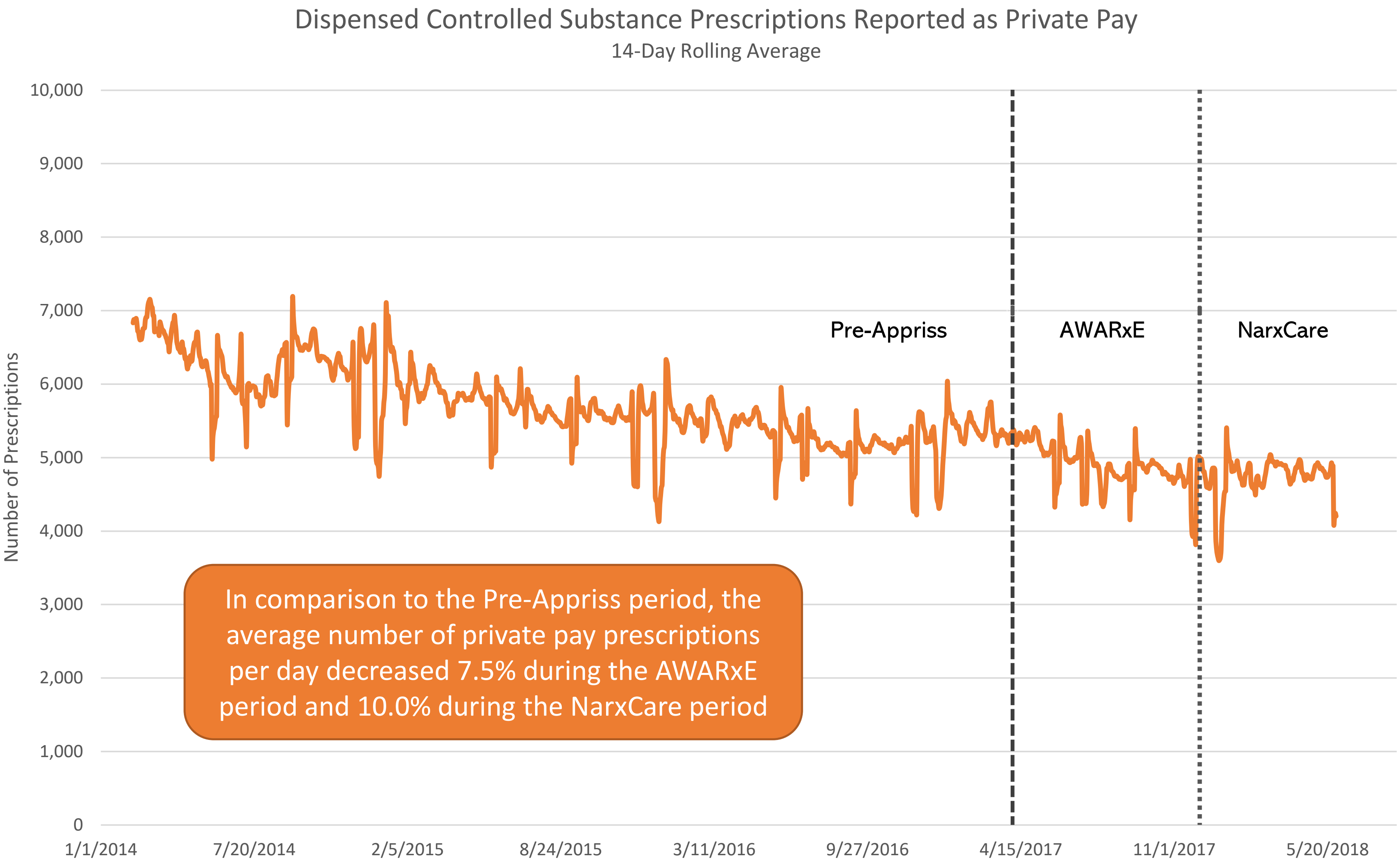
Each prescription filled is reported with one payment type. Payment types include:

1. Commercial Insurance
2. Medicare
3. Medicaid
4. Private Pay (cash/self-pay)
5. Other (e.g., worker's comp, military)



Note: All Michigan MAPS reportable prescriptions filled, no exclusions. Study period February 6, 2016 – May 31, 2018

Private Pay (Cash/Self-Pay)

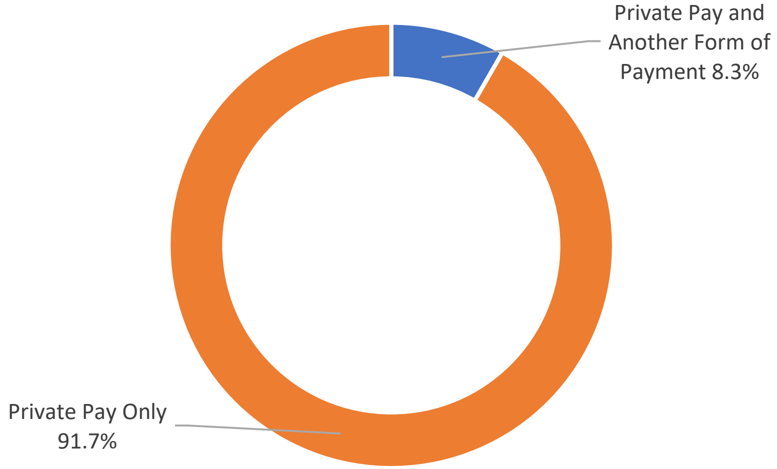


In comparison to the Pre-Appriss period, the average number of private pay prescriptions per day decreased 7.5% during the AWARxE period and 10.0% during the NarxCare period

Note: All Michigan MAPS reportable prescriptions filled, no exclusions. Study period February 6, 2016 – May 31, 2018
Pre-Appriss 2/6/2016—4/3/2017; AWARxE 4/4/4017—12/3/2017; NarxCare 12/4/2017—5/31/2018

Multiple Payment Types

- Private pay for a prescription, in itself, is not indicative of an at-risk patient behavior.
- There is a spike in the number of private pay dispensations each new year as insurance coverage changes, and downward trends could be associated with improved healthcare coverage.
- Multiple prescriptions for the same patient, filled on the same day with private pay and another form of payment (e.g. Commercial Insurance, Medicaid, Medicare) is a stronger indicator if risky behavior.

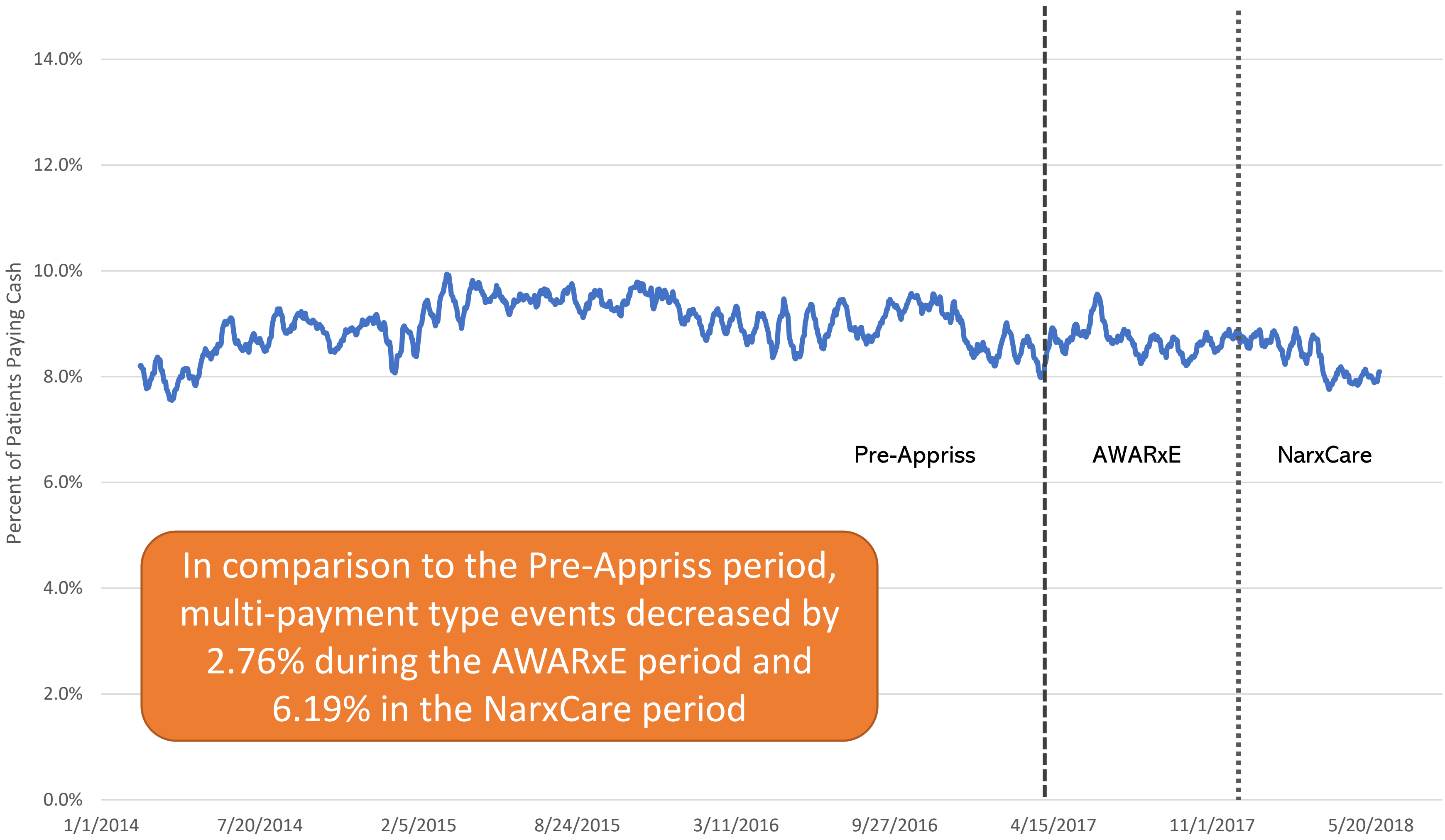


- Private pay can be used to circumvent health plan limits on how frequently prescriptions can be filled.
- In a single month, an average of 8.32% of patients using private pay will also use another form of payment for a second controlled substance prescription on the same day.

Note: All Michigan MAPS reportable prescriptions filled, no exclusions. Study period February 6, 2016 – May 31, 2018.

Multiple Payment Types on the Same Day

Percent of Patients Using Private Pay with an Additional Payment Type on the Same Day
14-Day Rolling Average



In comparison to the Pre-Appriss period, multi-payment type events decreased by 2.76% during the AWARxE period and 6.19% in the NarxCare period

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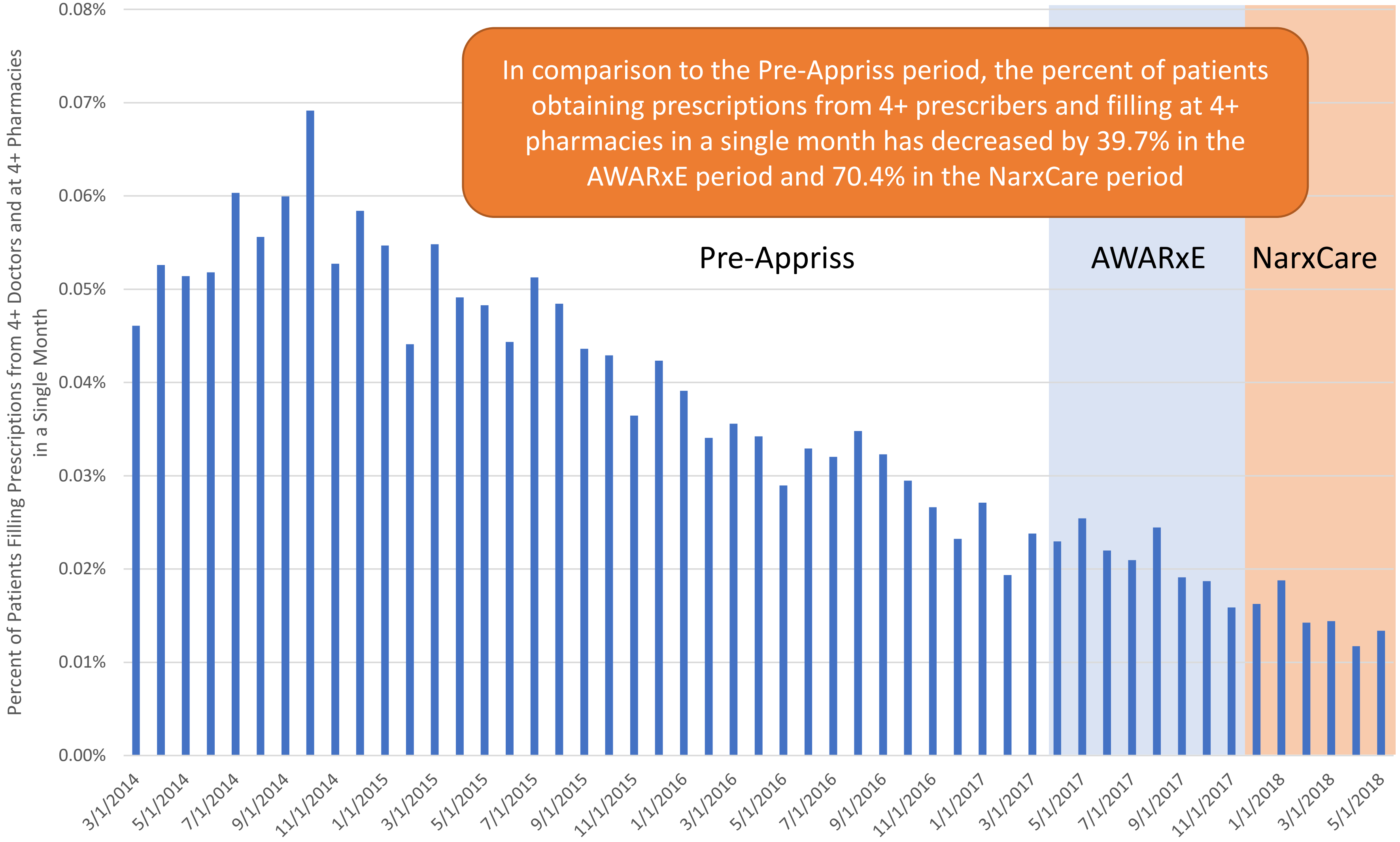
Percent of Patients Receiving Prescriptions from 4+ Prescribers and Dispensing at 4+ Pharmacies in a Single Month



In comparison to the Pre-Appriss period, the percent of patients obtaining prescriptions from 4+ prescribers and filling at 4+ pharmacies in a single month has decreased by 39.7% in the AWARxE period and 70.4% in the NarxCare period

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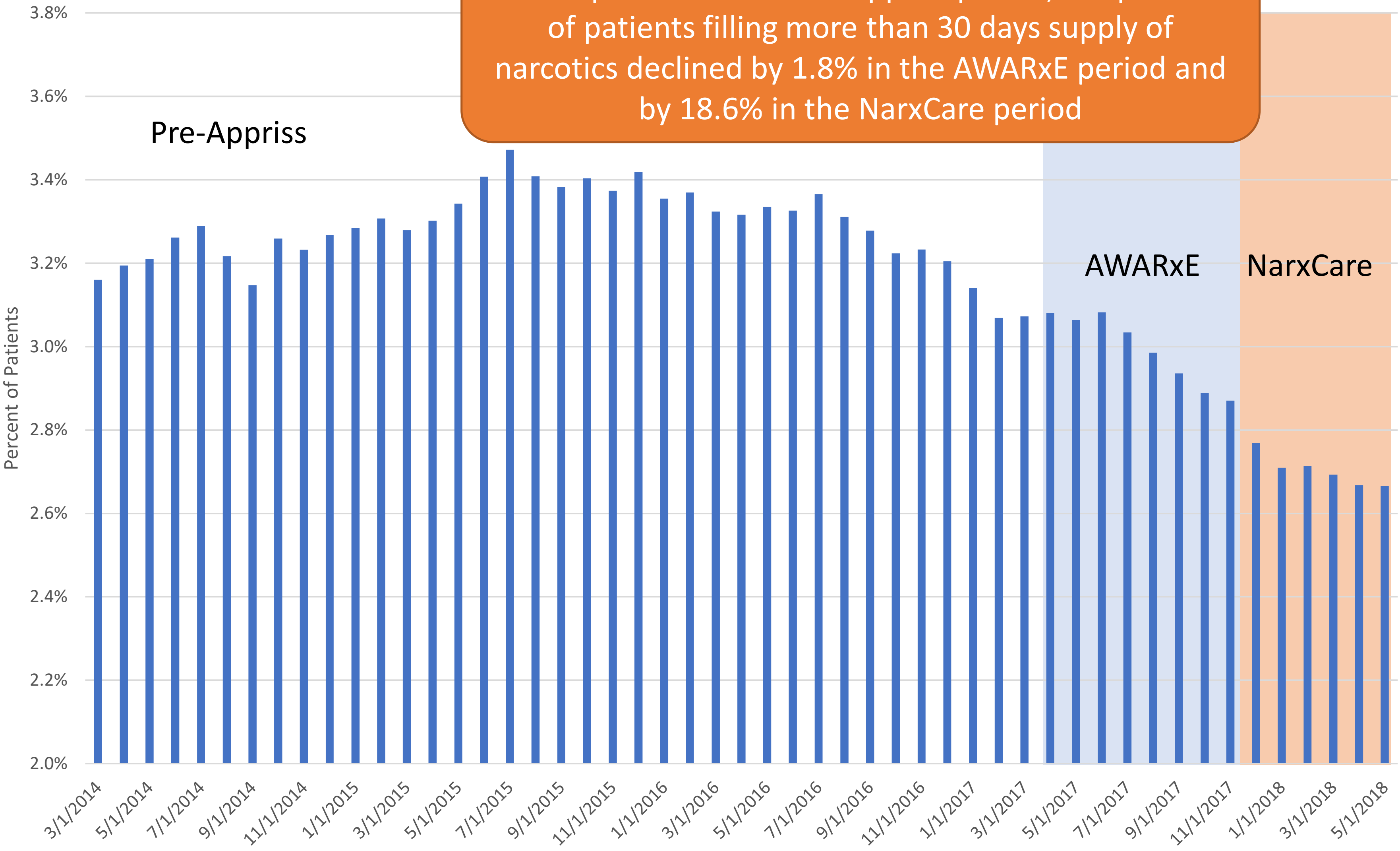
Percent of Patients Receiving Greater than 30 Days' Supply of Narcotics Per Month

In comparison to the Pre-Appriss period, the percent of patients filling more than 30 days supply of narcotics declined by 1.8% in the AWARxE period and by 18.6% in the NarxCare period



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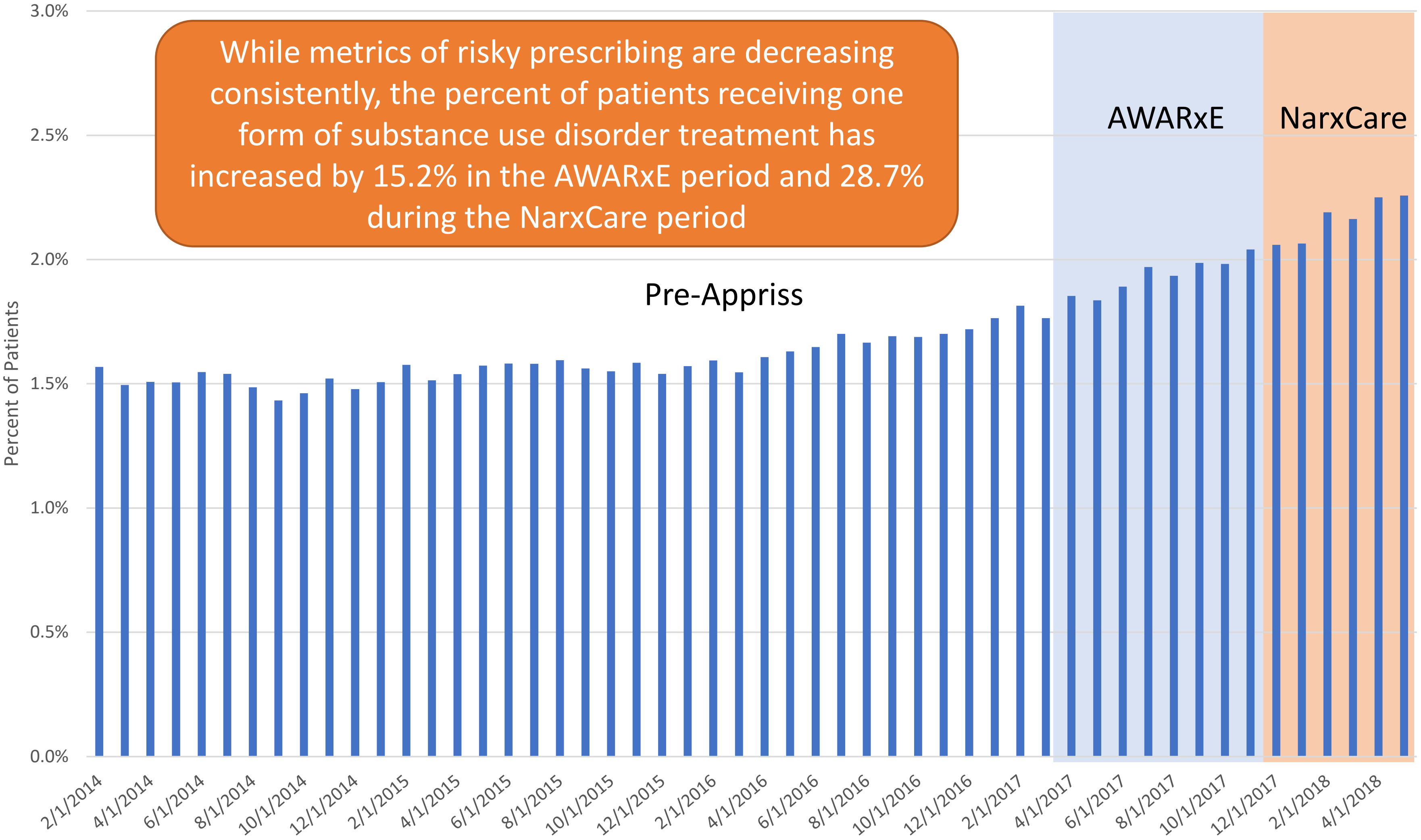
Pre-Appriss 2/6/2016—4/3/2017; AWARxE 4/4/4017—12/3/2017; NarxCare 12/4/2017—5/31/2018

Percent of Patients Prescribed Buprenorphine for Medication Assisted Treatment (MAT) per Month


While metrics of risky prescribing are decreasing consistently, the percent of patients receiving one form of substance use disorder treatment has increased by 15.2% in the AWARxE period and 28.7% during the NarxCare period

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Pre-Appriss 2/6/2016—4/3/2017; AWARxE 4/4/4017—12/3/2017; NarxCare 12/4/2017—5/31/2018.
Buprenorphine MAT is one of several forms of substance abuse treatment, and the only form that is prescribed to the patient in a manner that is recorded in the PDMP. Buprenorphine MAT dispensations are identified from NDC codes reported for the dispensation.

Trends in At-Risk Prescription Filling Behavior by Study Period

	Avg. Monthly Percent of Patients 4+ prescribers and 4+ Pharmacies		Avg. Monthly Percent of Patients Filling More than 30 Days of Narcotics		Avg. Monthly Percent of Patients Filling Buprenorphine MAT Prescriptions	
Period	Percent	Change	Percent	Change	Percent	Change
Pre-Appriss	0.05%	--	3.3%	--	1.7%	
AWARxE	0.03%	-39.7%	3.3%	-1.6%	1.9%	15.2%
NarxCare	0.01%	-70.4%	2.7%	-18.7%	2.2%	28.7%

- The average monthly percent of patients using 4+ prescribers and 4+ pharmacies to fill controlled substance prescriptions has declined by 70.4% since implementation of AWARxE.
- 18.7% fewer patients are filling narcotic prescriptions with an extensive duration (> 30 days).
- Compared to the Pre-Appriss period, the monthly average percent of patients receiving substance use disorder treatment medications has increased by 15.2% during AWARxE and 28.7% during NarxCare.

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Pre-Appriss 2/6/2016—4/3/2017; AWARxE 4/4/4017—12/3/2017; NarxCare 12/4/2017—5/31/2018.
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Summary 1

- In comparison to the Pre-Appriss period, the total number of controlled substance prescriptions filled in Michigan decreased 3.5% during the AWARxE period and 7.3% during the NarxCare period. Most of this decline is due to fewer narcotic prescriptions, decreasing 5.6% during the AWARxE period and 11.1% during the NarxCare period.
- While the number of narcotic prescriptions was decreasing prior to implementation of AWARxE, the rate of the decline has accelerated from 4.5 fewer narcotic prescriptions filled each day in the Pre-Appriss period to 14.7 fewer during the NarxCare period.
- In comparison to other states, Michigan has 14.4% less of their PDMP patient population receiving narcotic prescriptions each day, with the rate decreasing the most during the NarxCare period. Michigan: 52.0% and Comparison States: 66.4%.
- Patients identified as “abusive’ have been receiving fewer narcotic prescriptions. More patients are receiving non-narcotic controlled substance alternatives during the AWARxE and NarxCare periods.
- Private pay payments have decreased, and private pay/multi-payment types have also decreased during the AWARxE and NarxCare periods.
- In comparison to the Pre-Appriss period, patients identified as receiving controlled substance prescriptions from 4+ prescribers and filling at 4+ pharmacies has decreased by 39.7% during the AWARxE period and 70.4% during the NarxCare period.
- Compared to the Pre-Appriss period, patients receiving more than a 30 days’ supply of narcotics in a single month has decreased by 18.6% during the NarxCare period.
- The percent of patients receiving Buprenorphine MAT (a substance use disorder medication) has increased 15.2% during the AWARxE period and 28.7% during the NarxCare period.

Additional Analyses

Opioid Misuse

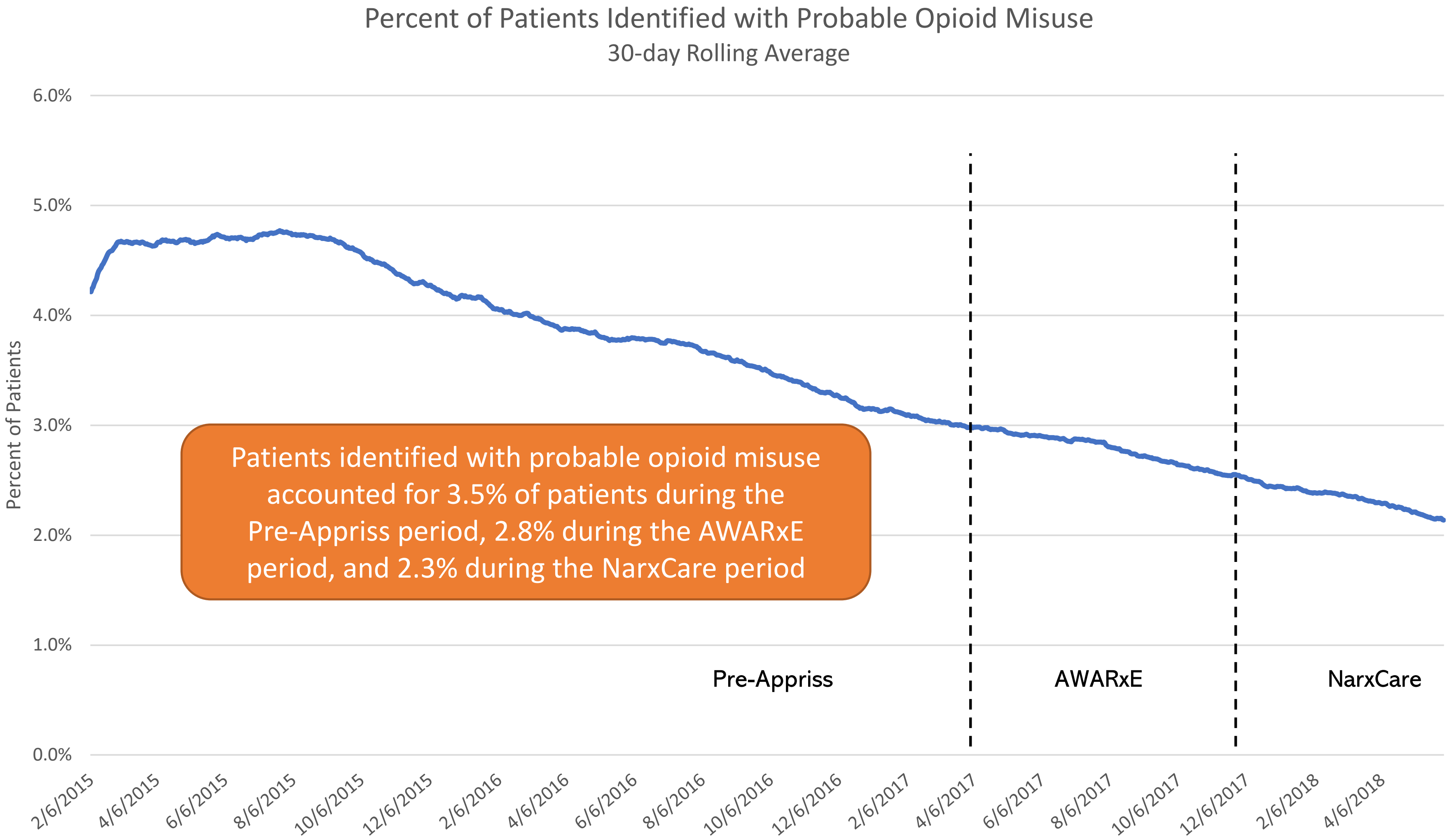
Criteria	0 Points	1 Point	2 Points
Number of opioid prescribers in the past year	≤2	3-4	≥5
Number of pharmacies used to fill opioid prescriptions in past year	≤2	3-4	≥5
Excessive days prescribed of short-acting opioids in the past year	≤365 days	366-547 days	>547 days
Excessive days prescribed of long-acting opioids in the past year	≤365 days	366-547 days	>547 days

After scoring each misuse criteria, sum the total points per patient (Range: 0-8)

- No Misuse (<2 pts)
- Possible Misuse (2-4 pts)
- Probable Misuse (5+ pts)

Opioid Misuse Score Source: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2897915/

Opioid Misuse



Patients identified with probable opioid misuse accounted for 3.5% of patients during the Pre-Appriss period, 2.8% during the AWARxE period, and 2.3% during the NarxCare period

Opioid Misuse Score Source: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2897915/
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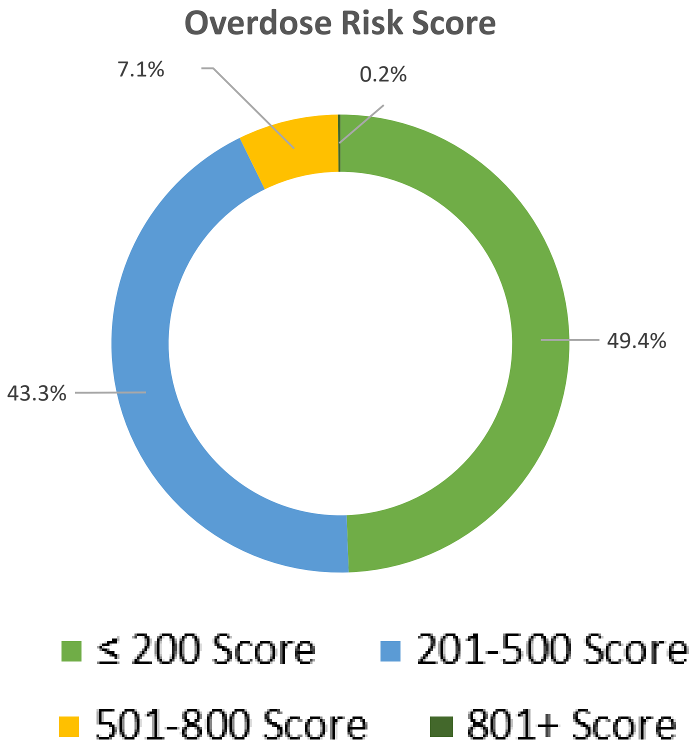
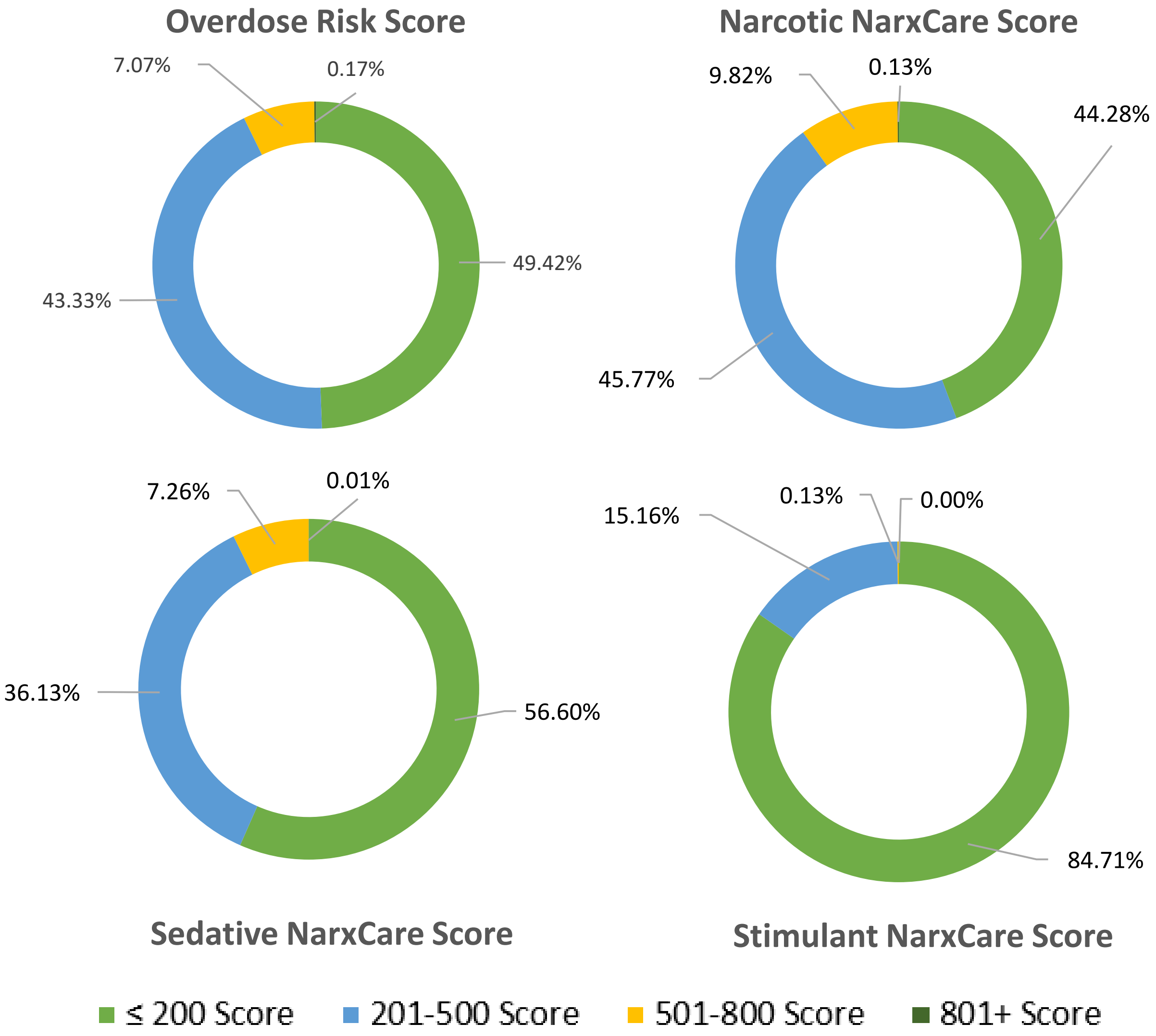
Average Monthly NarxCare Score Distribution

- Each month, an average 1,117,643 patients received at least one controlled substance prescription.
    - These patients were scored for each NarxCare score, that ranges from 0-999 and reflect the patient's prior two years of behavior.
    - Scores 200 and lower represent patients with very low risk/utilization.
    - Scores between 200 and 500 include most patients with an acute need, as well as many chronic pain patients.
    - Scores between 500 and 800 include patients who frequently receive controlled substances.
    - Scores above 800 include patients who are extreme outliers.



Note: All Michigan MAPS reportable prescriptions filled, no exclusions. Study period February 6, 2016 – May 31, 2018
Pre-Appriss 2/6/2016—4/3/2017; AWARxE 4/4/4017—12/3/2017; NarxCare 12/4/2017—5/31/2018

Average Monthly NarxCare Score Distribution



Overdose Risk Score

Narcotic NarxCare Score

Sedative NarxCare Score

Stimulant NarxCare Score

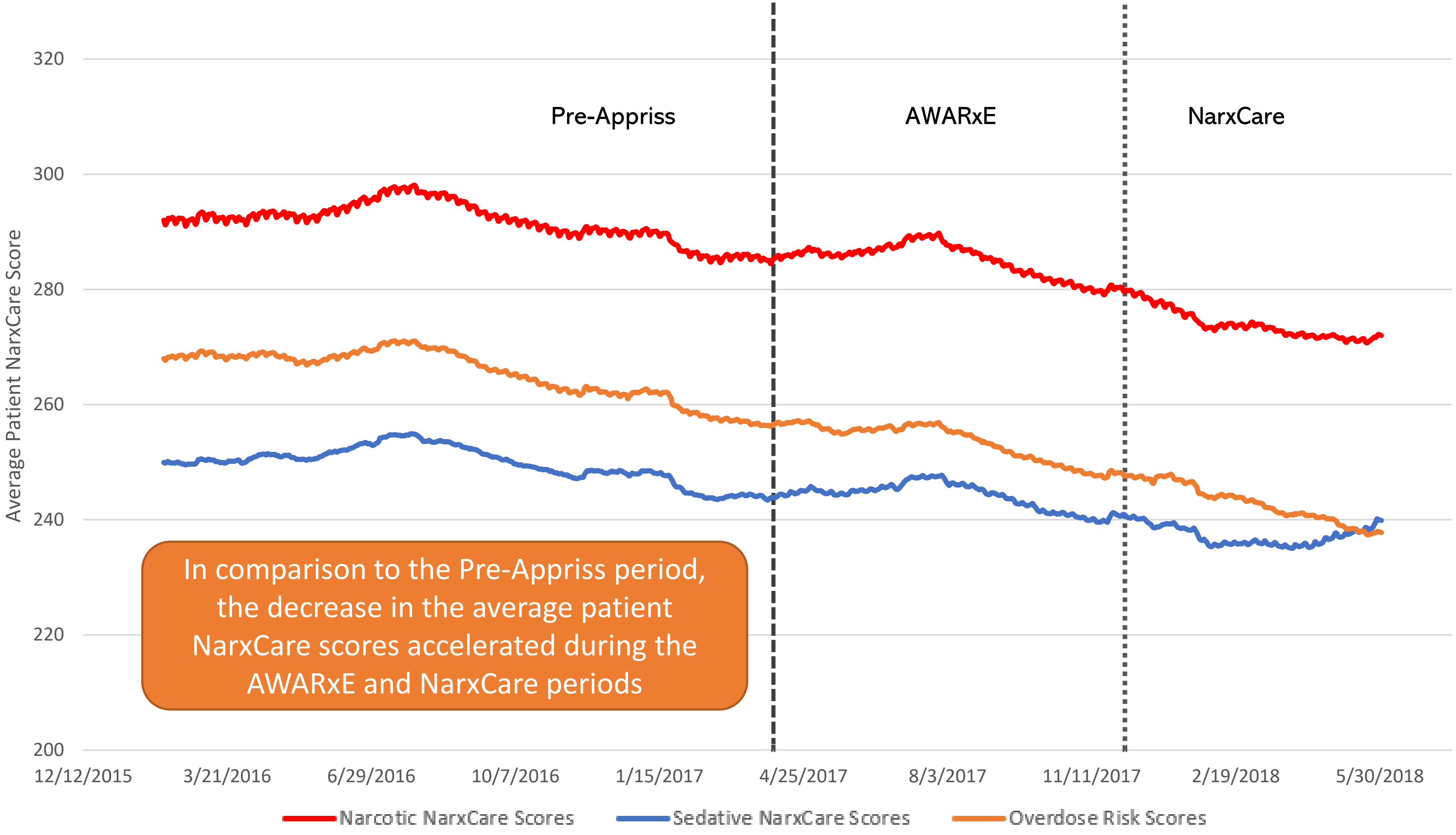
- NarxCare scores reflect how frequently a patient fills the listed drug type.
- Narcotic NarxCare scores tend to be higher than the Overdose Risk scores for the same patients.
- Very few patients use stimulants extensively, therefore 84.7% of patients have Simulant NarxCare scores less than 200.

Note: All Michigan MAPS reportable prescriptions filled, no exclusions. Study period February 6, 2016 – May 31, 2018
Pre-Appriss 2/6/2016—4/3/2017; AWARxE 4/4/4017—12/3/2017; NarxCare 12/4/2017—5/31/2018

NarxCare Scores

Average NarxCare Scores of Michigan Controlled Substance Patient Population

30-Day Rolling Average



In comparison to the Pre-Appriss period, the decrease in the average patient NarxCare scores accelerated during the AWARxE and NarxCare periods

Note: All Michigan MAPS reportable prescriptions filled, no exclusions. Study period February 6, 2016 – May 31, 2018
Pre-Appriss 2/6/2016—4/3/2017; AWARxE 4/4/4017—12/3/2017; NarxCare 12/4/2017—5/31/2018

NarxCare Score Outliers (Above 800)

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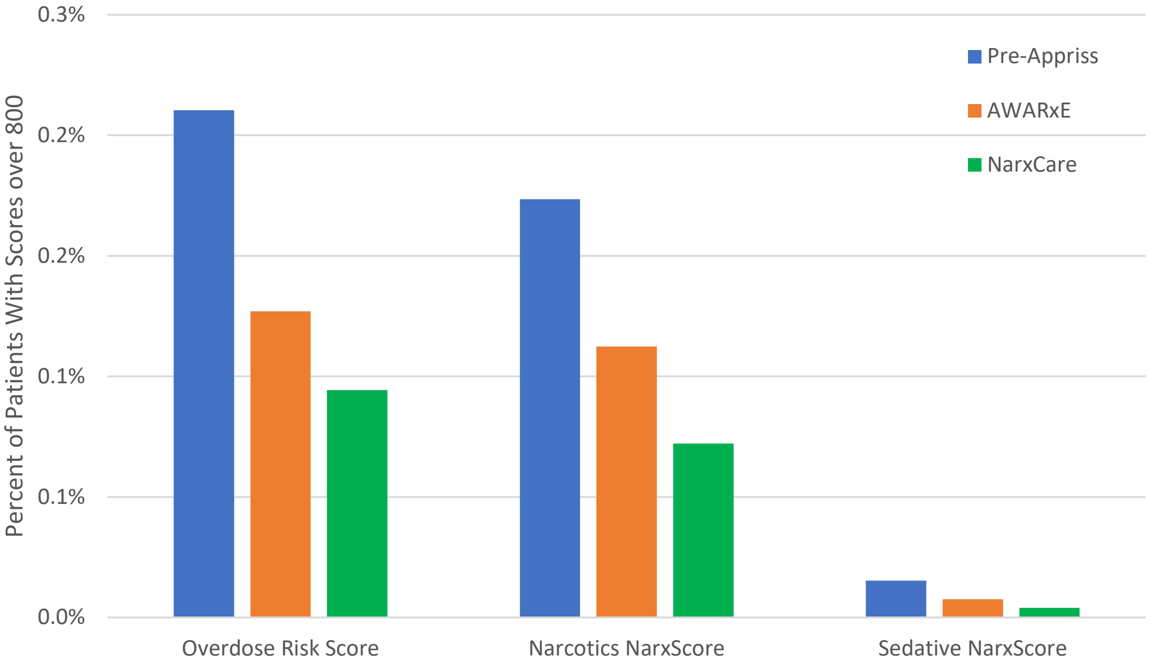

In comparison to the Pre-Appriss period, the average percentage of patients with an Overdose Risk Score above 800 (highest risk) was 39.7% lower during the AWARxE period and 55.2% lower during the NarxCare period.

Note: All Michigan MAPS reportable prescriptions filled, no exclusions. Study period February 6, 2016 – May 31, 2018
Pre-Appriss 2/6/2016—4/3/2017; AWARxE 4/4/4017—12/3/2017; NarxCare 12/4/2017—5/31/2018

NarxCare Score Outliers (Above 800)

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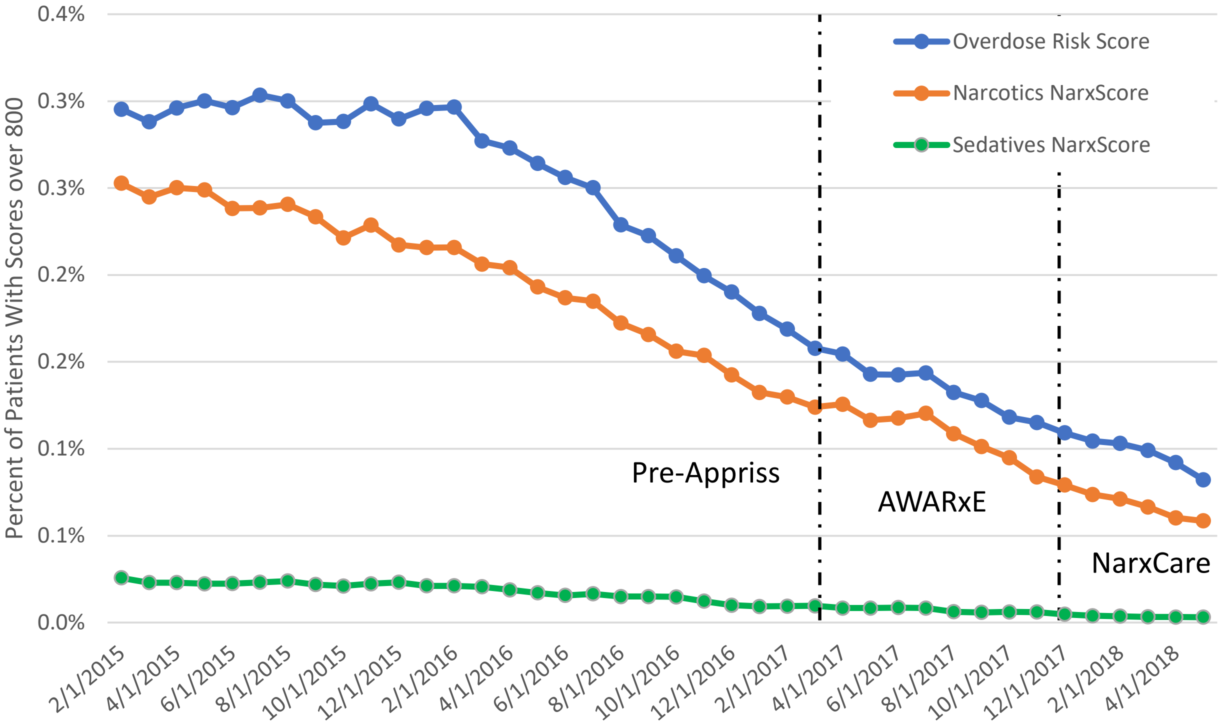

In comparison to the Pre-Appriss period, the percentage of patients with a Narcotics NarxCare score over 800 decreased an average of 35.2% during the AWARxE period and 58.4% during the NarxCare period.

Note: All Michigan MAPS reportable prescriptions filled, no exclusions. Study period February 6, 2016 – May 31, 2018
Pre-Appriss 2/6/2016—4/3/2017; AWARxE 4/4/4017—12/3/2017; NarxCare 12/4/2017—5/31/2018

Identifying Chronic Patients

- Without diagnosis data, it is difficult to identify which patients are chronic pain patients who need continued access to pain medications, and which patients are receiving too many opioids.
- Several definitions have been suggested to identify such patients. Two different definitions were used in this analysis:

Definition 1: Quality of Opioid Prescribing (Pharmacy Quality Alliance)	**Definition 2: Long-Term Opioid Patients (Appriss Definition)**
Patients had to have 2+ opioid prescriptions, each with 15 days or more days supply in the past year	Patients had to have at least one prescription where the preceding 90% of days in the last two years had active narcotic prescriptions.
Number of patients assessed changes each month	Creates a cohort of patients who ever met this criteria
Identifies at-risk patients based on three criteria **1. High dosage** **2. Multiple Pharmacies/Prescribers** **3. Concurrent Benzodiazepine-Narcotic Use**	Used to identify good prescribing practices for patients who likely need continuing pain care.

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Method #1:
Quality of Opioid Prescribing Criteria

Note: All Michigan MAPS reportable prescriptions filled, no exclusions. Study period February 6, 2016 – May 31, 2018
Pre-Appriss 2/6/2016—4/3/2017; AWARxE 4/4/4017—12/3/2017; NarxCare 12/4/2017—5/31/2018

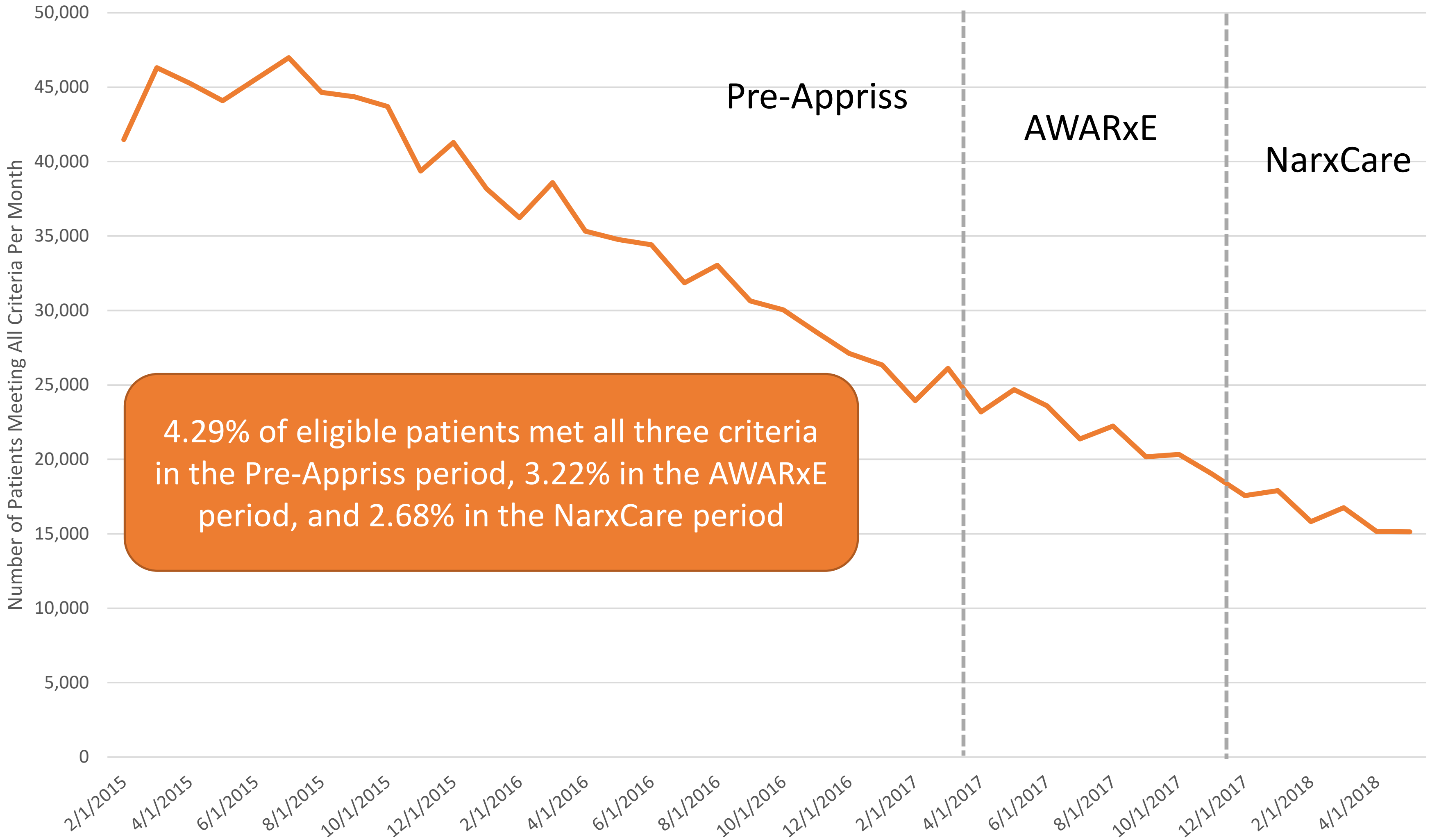
Quality of Opioid Prescribing

- Follows the Pharmacy Quality Alliance definitions:
  - Patients had to have 2+ opioid prescriptions with 15 days supply or more in the prior year to be eligible (as of date of prescription fill).

  - Poor prescribing was defined as patients who met three criteria in the 365 days prior to a prescription fill date.
    1. **High dosage**: 120+ MME for 90+ days in the year prior to the prescription.
    2. **Multiple Pharmacies/prescribers**: Filled opioid prescriptions at 4+ different pharmacies and written by 4+ different prescribers in the year prior.
    3. **Concurrent Benzodiazepine—Narcotic Use**: Had 30+ days with an active narcotic prescription and a concurrent active benzodiazepine prescription, with at least two benzodiazepine prescriptions during the prior year.

  - Counted total number of patients who met each criteria, any of the three criteria, and all three criteria.

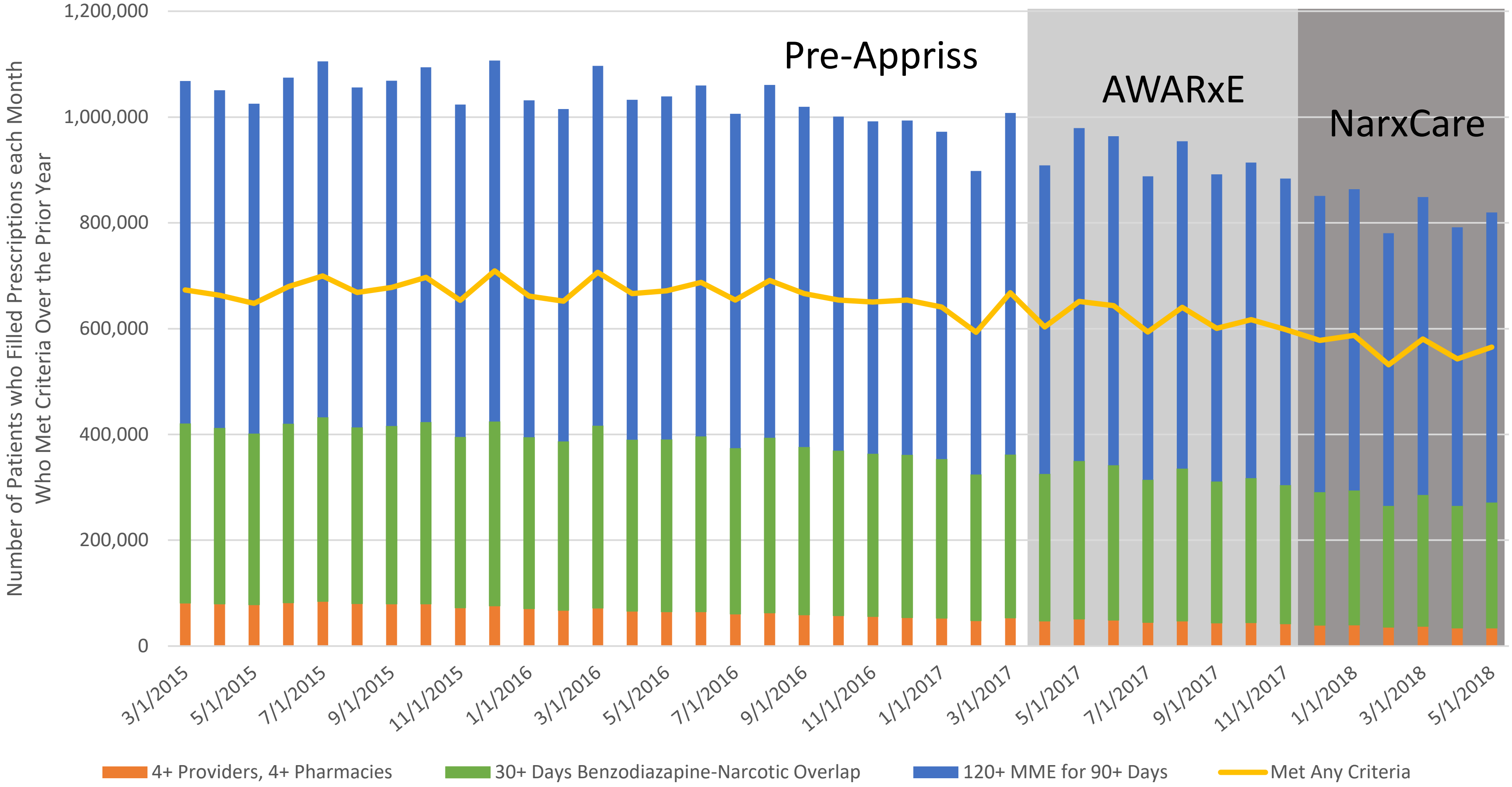
Quality of Opioid Prescribing - Met All Criteria



4.29% of eligible patients met all three criteria in the Pre-Appriss period, 3.22% in the AWARxE period, and 2.68% in the NarxCare period

Note: All Michigan MAPS reportable prescriptions filled, no exclusions. Study period February 6, 2016 – May 31, 2018
Pre-Appriss 2/6/2016—4/3/2017; AWARxE 4/4/4017—12/3/2017; NarxCare 12/4/2017—5/31/2018

Quality Opioid Prescribing - by Criteria



Meeting the criteria of 120+MME for 90 or more days was most common, followed by more than 30 days of overlapping benzodiazepine and narcotic prescriptions. On average, 90% of eligible patients met these two criteria

Note: All Michigan MAPS reportable prescriptions filled, no exclusions. Study period February 6, 2016 – May 31, 2018
Pre-Appriss 2/6/2016—4/3/2017; AWARxE 4/4/4017—12/3/2017; NarxCare 12/4/2017—5/31/2018

Quality Opioid Prescribing

Period	Δ per Day in Number of Patients Having 90+ Days in the Last Year with MME 120+	Δ per Day in Number of Patients Visiting 4+ Prescribers and 4+ Pharmacies in the Last Year	Δ per Day in Number of Patients Having 30+ Days of Concurrent Benzodiazepine and Narcotic Prescriptions	Δ per Day in Number of Patients Meeting Any Criteria	Δ per Day in Number of Patients Meeting All Criteria
Pre-Appriss	-3.36	-1.65	-3.18	-3.68	-1.09
AWARxE	-7.03	-1.42	-5.42	-7.41	-0.91
NarxCare	-8.85	-1.53	-5.95	-9.36	-0.75

Period	Percent of Patients Having 90+ Days in the Last Year with MME 120+	Percent of Patients Visiting 4+ Prescribers and 4+ Pharmacies in the Last Year	Percent of Patients Having 30+ Days of Concurrent Benzodiazepine and Narcotic Prescriptions	Percent of Patients Meeting Any Criteria	Percent of Patients Meeting All Criteria
Pre-Appriss	88.1%	8.2%	43.6%	91.3%	4.3%
AWARxE	88.4%	6.8%	41.2%	91.4%	3.2%
NarxCare	89.4%	6.0%	39.5%	92.1%	2.7%

- In comparison to the Pre-Appriss period, there was a decrease in number of patients with 90+ days of extremely high MME (above 120 MME/day) of 7.03 patients per day during the AWARxE period and 8.85 patients per day during the NarxCare period.
- Despite a decline in the absolute number of eligible patients with 90+ days of high MME, the percent of the eligible population who met that criteria has increased.

Note: All Michigan MAPS reportable prescriptions filled, no exclusions. Study period February 6, 2016 – May 31, 2018
Pre-Appriss 2/6/2016—4/3/2017; AWARxE 4/4/4017—12/3/2017; NarxCare 12/4/2017—5/31/2018

Method #2:

Long-term Opioid Patients and Appropriate Prescribing

(Appriss Definition)

Note: All Michigan MAPS reportable prescriptions filled, no exclusions. Study period February 6, 2016 – May 31, 2018
Pre-Appriss 2/6/2016—4/3/2017; AWARxE 4/4/4017—12/3/2017; NarxCare 12/4/2017—5/31/2018

Measuring Appropriate Prescribing To Long-Term Opioid Patients

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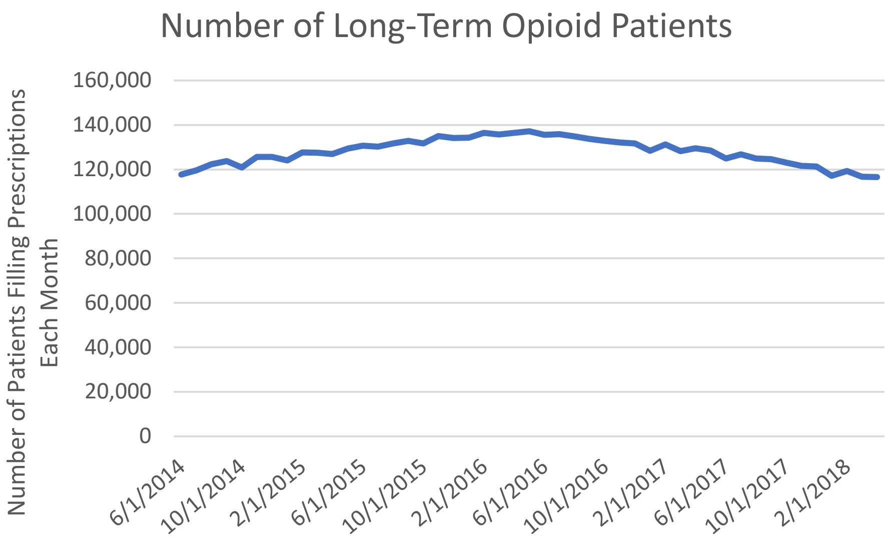


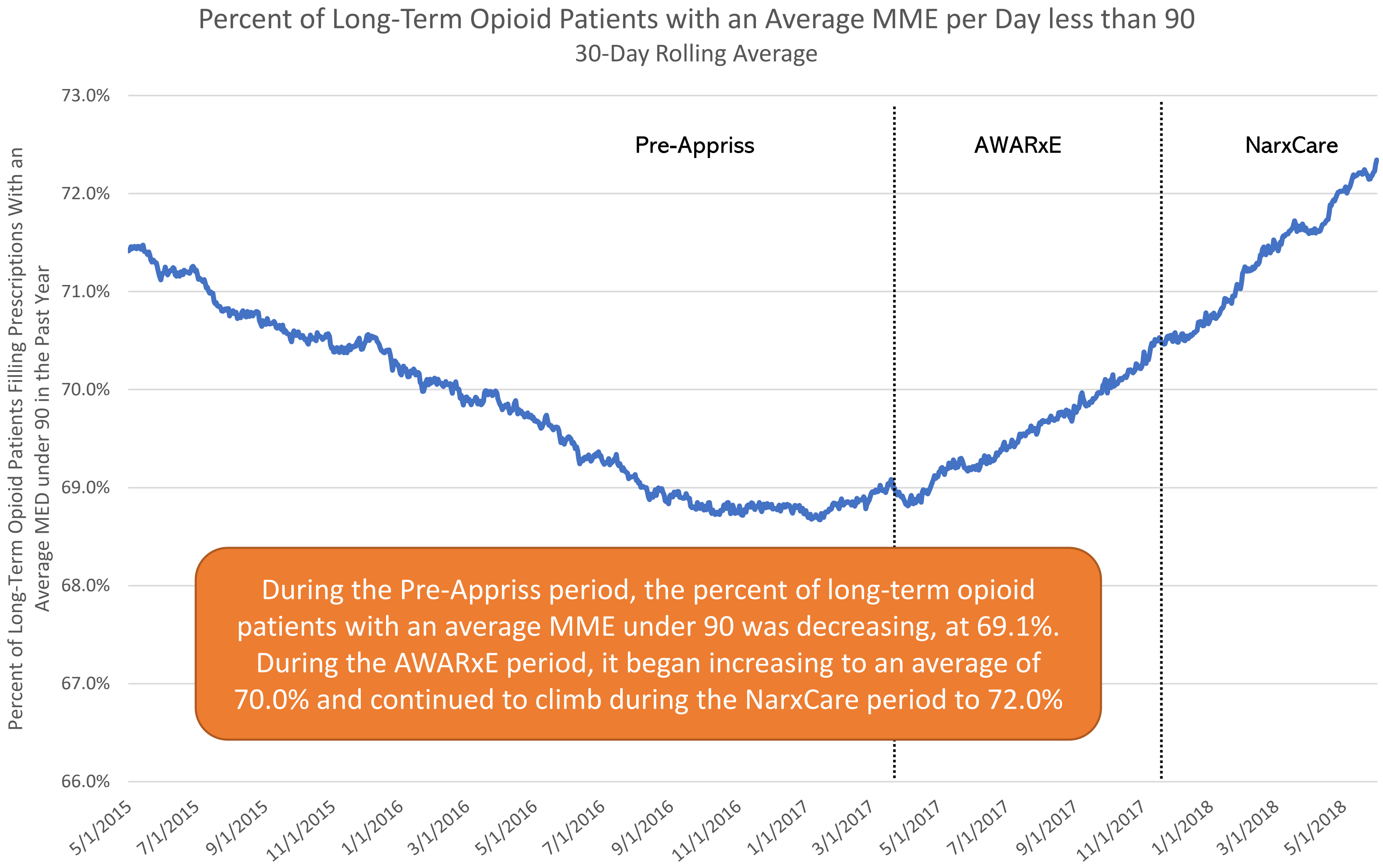
- Identified any patient who filled a prescription between 5/31/2016 and 5/31/2018 and had, as of the date of the prescription fill, an active opioid prescription for 90% of the days in the prior two years.

- This cohort (N=140,067) was tracked over all three study periods.

- 83.2% of this cohort was still filling prescriptions during May 2018
    - Patients who were no longer filling prescriptions could have moved out of state, recovered, died, or are no longer receiving controlled substance medications.

Note: Long-term opioid patients in Michigan. All Michigan MAPS reportable prescriptions filled, no exclusions Study period February 6, 2016 – May 31, 2018. Pre-Appriss 2/6/2016—4/3/2017; AWARxE 4/4/4017—12/3/2017; NarxCare 12/4/2017—5/31/2018.

90 MME per Day or Less



During the Pre-Appriss period, the percent of long-term opioid patients with an average MME under 90 was decreasing, at 69.1%. During the AWARxE period, it began increasing to an average of 70.0% and continued to climb during the NarxCare period to 72.0%

Note: Long-term opioid patients in Michigan. All Michigan MAPS reportable prescriptions filled, no exclusions. Study period February 6, 2016 – May 31, 2018. Pre-Appriss 2/6/2016—4/3/2017; AWARxE 4/4/4017—12/3/2017; NarxCare 12/4/2017—5/31/2018.

No Benzodiazepine-Narcotic Overlaps

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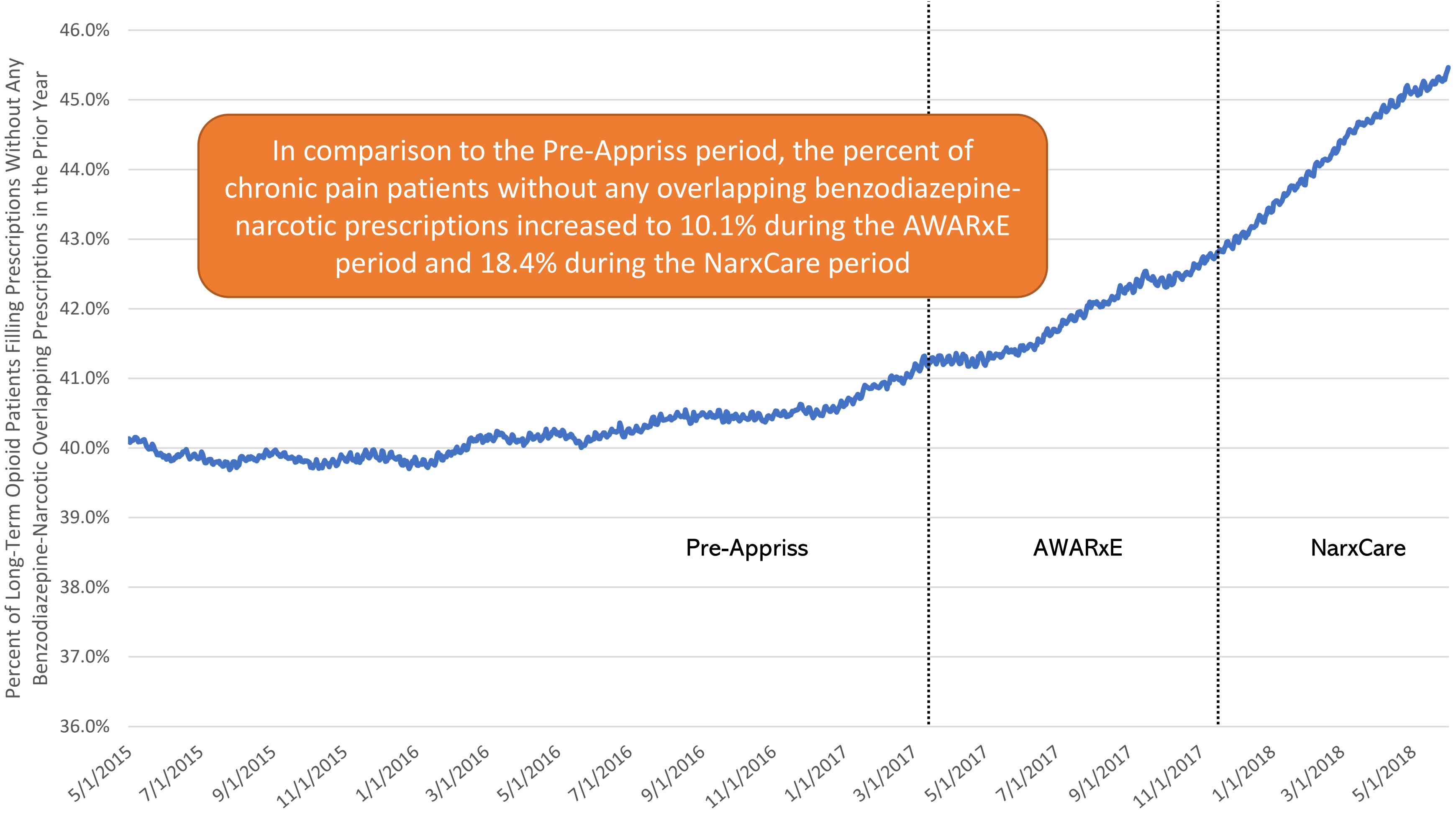

Percent of Long-Term Opioid Patients Without any Benzodiazepine-Narcotic Overlaps in the Prior Year

30-Day Rolling Average

In comparison to the Pre-Appriss period, the percent of chronic pain patients without any overlapping benzodiazepine-narcotic prescriptions increased to 10.1% during the AWARxE period and 18.4% during the NarxCare period

Note: Long-term opioid patients in Michigan. Study period February 6, 2016 – May 31, 2018
Pre-Appriss 2/6/2016—4/3/2017; AWARxE 4/4/4017—12/3/2017; NarxCare 12/4/2017—5/31/2018.

Summary 2

- Patients identified with probable opioid misuse (definition 1) decreased from 3.5% during the Pre-Appriss period to 2.8% during the AWARxE period, then to 2.3% during the NarxCare period.
- The average NarxCare Score for patients decreased during the AWARxE and NarxCare periods. In comparison to the Pre-Appriss period, the patients with high Overdose Risk Scores decreased by 39.7% during the AWARxE period and 55.2% during the NarxCare period, and patients with high Narcotic Risk Scores decreased by 35.2% during the AWARxE period and 58.4% during the NarxCare period.
- Among patients with at least two opioid prescriptions (each longer than 15 days), the percent of patients meeting all three Pharmacy Quality Alliance criteria decreased by 4.3% during the Pre-Appriss period, to 3.2% during the AWARxE period, and 2.7% during the NarxCare period.
- 83.2% of long-term opioid patients are still filling controlled substance prescriptions at the end of the study.
- Two metrics of good prescribing to long-term opioid patients have improved: The percent of patients filling an average daily MME less than 90, and the percent of patients with no benzodiazepine-narcotic overlaps in the past year. This can be correlated with the implementation of AWARxE.