Methamphetamine and Opioid Assessment: Barry County

An in-depth analysis of methamphetamine and opioid related issues in Barry County, Michigan to inform local efforts.

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Report developed by Kori Bissot

KORI.BISSOT@KWBSTRATEGIES.NET

P: 616.566.7890

KWB Strategies

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EXECUTIVE SUMMARY

The Barry County Substance Abuse Prevention Task Force (SATF) and Barry County Community Mental Health Authority (BCCMHA) commissioned this report to assess the scope of methamphetamine and opioid misuse in Barry County. In recent years, local efforts have worked to address the opioid epidemic. During this time, methamphetamine has emerged as a growing problem. This report is intended to inform data-driven planning to mitigate the growing threat of methamphetamine and assess the current state of opioid misuse in the county.

EVIDENCE OF A GROWING PROBLEM

In the early 2000's, methamphetamine (MA) was a significant problem in southwest Michigan. Following state-wide legislation restricting the purchase of pseudoephedrine in 2004, use of MA issues decreased.

In Barry County, MA has re-emerged as a problem in recent years as evidenced by:

- 240% increase in publicly funded substance use disorder (SUD) treatment admissions identifying MA as the primary drug (from 23 to 78) between 2015 and 2020; more than double the 36 admissions in 2005. (MI-SUDDR.com)[1]
- 45% of BCCMHA admissions to SUD treatment in FY20 were for MA as the primary drug, surpassing all other substances.[2]
- 36% of Barry County residents surveyed in 2021 reported that MA is an issue in Barry County 'to a great extent', and 41% reported MA as one of the biggest drug problems in the county.[3]
- 80% of admissions for BCCMHA with an opioid identified as the primary drug reported MA as a non-primary drug, increasing continually since FY17 at 13%.[2]

Opioids continue to be an issue with overdose deaths remaining relatively stable while admissions to publicly funded treatment have been decreasing.

- 64% decrease in publicly funded SUD treatment admissions identifying heroin or a prescription opioid as the primary drug (from 101 to 36) between 2015 and 2020.[1]
- Only 11.9% of BCCMHA admissions to SUD treatment in FY20 had an opioid as the primary drug, continually decreasing since FY16 at 27.6%. [2]
- Overdose deaths involving an opioid continue to be an issue with 51 occurring between 2011 and 2019. Of these, 12 also involved a psychostimulant with abuse potential.[1,4]

[1] www.MI-SUDDR.com
[2] Barry County Community Mental Health Association, Behavioral Health Treatment Episode Data Set (BCCMHA BHTEDS)
[3] Barry County Substance Abuse Adult Community Survey, 2021
[4] Michigan Death Certificate File, Division for Vital Records and Health Statistics

TREATING METHAMPHETAMINE USE DISORDERS:

Unique Challenges: Providers of SUD services

report that clients entering treatment for MA present with numerous challenging issues that complicate treatment, including:

- Lack of ancillary services to support other needs.
- Need for supportive sober housing.
- Difficulty accessing residential treatment and short duration of residential services.

Treatment Outcomes:

- 44% of clinicians reported that treatment outcomes for individuals with MA addiction were 'somewhat' or 'much worse' than for other drugs, compared to 19% for opioids.
- 38% of clinicians reported that their agency provides specialized treatment for MA, compared to 50% for opioids.
- A review of discharge records for BCCMHA found both MA and opioid involved admissions were:
    - slightly less likely to 'complete treatment'.
    - slightly more likely to 'drop out' than admissions without these substances involved.
    - Compared to alcohol and marijuana, opioid involved admissions were the most likely to be discharged as 'Dropped out' and least likely to be reported as 'Completed Treatment'.

Support Needed by SUD Treatment Providers**:** When clinicians were asked what would most help improve treatment outcomes for clients who use methamphetamine (MA), their responses indicate the need for:

- Transportation to appointments
- Inpatient treatment options, with longer periods of care
- Continued research on medication that could assist recovery
- Social supports in the community

INTRODUCTION

The Barry County Substance Abuse Prevention Task Force (SATF) commissioned KWB Strategies to conduct this report to assist the community in understanding the current and historical prevalence of MA related problems in the county.

The primary focus of this report is methamphetamine (MA) with a secondary focus on opioids. Misuse of other stimulants not been included in this report because cocaine admissions to treatment remain very low and prescription drug misuse of stimulants has been given much attention in recent years. Polysubstance use of stimulants and opioids will be discussed due to the dangers and prevalence of combining opioid and stimulant use.

The purpose of this assessment is to:

- Explore the local magnitude, impact, and unique challenges of MA and other illicit stimulants in the county.
- Provide actionable information.
- Identify available research-based interventions.
- Support development of targeted, data-driven strategies to address illicit stimulant use.

Methodology

The following report relied on multiple methods to collect information related to methamphetamine and opioid use and related consequences in Barry County. Where local data was not available, or feasible to collect, state and national research studies are referenced. When a fiscal year (FY) is referenced, it represents a period of October 1st through September 30th of the year identified.

DATA SOURCES

Behavioral Health Treatment Episode Data Set (BHTEDS):

BHTEDS data for select items from admission and discharge records were provided to the researcher for FY16- FY20 for Barry County Community Mental Health Authority. These records include all publicly funded treatment admissions for residents of Barry County to this provider for these years. Unless otherwise specified, treatment admission data referenced is from this source.

Data for all Barry County Residents admitted to publicly funded treatment by primary drug was retrieved via https://mi-suddr.com.

Overdose deaths: Data from the Michigan Death Certificate File, Division for Vital Records and Health Statistics, was provided upon request by the Michigan

Department of Health and Human Services for overdoses involving psychostimulants with abuse potential. Overdose deaths involving opioids were retrieved via https://mi-suddr.com.

Arrests: The Criminal Justice Information Center of the Michigan State Police provided data from the Michigan Incident Crime Reporting Unit for 2017 through 2019 and was generated using the online report query tool. The generated reports include all arrests in Barry County by specific offense.

MA related arrests were calculated including MA (possession, manufacture, delivery, maintaining/operating a meth lab, use, and solicit to purchase) and crystal meth (possession, delivery, manufacture, and use). Opioid related arrests include heroin and opium possession, sales, and use.

High Intensity Drug Trafficking Areas (HIDTA) Drug Seizures: Upon request data collected by HIDTA for drug seizures reported by Michigan HIDTA initiatives (drug teams) was provided for 2015 through 2020. Data was exported from the HIDTA Performance Management Process (PMP) database. It is important to note that this ONLY captures drug seizures reported by Michigan HIDTA initiatives (drug teams). HIDTA seizures data was calculated for Barry County.

It is important to note that data provided by HIDTA does not contain seizures conducted by other (non-HIDTA funded) federal, state, or local law enforcement agencies and therefore may be an underrepresentation of drugs seized in the area. Barry County is not a designated high intensity drug trafficking area so drug seizures by local law enforcement are likely not included in this dataset.

SUD Treatment Clinician Survey: During July of 2021, an online questionnaire was conducted with substance use disorder treatment providers, individuals involved in the local drug courts, and probation/parole officers. Seventeen individuals completed the survey representing Barry County Community Mental Health Authority, Barry County Adult Specialty Treatment Court, Department of Corrections, and Cherry Health Service.

Michigan Profile for Health Youth: The Michigan Profile for Healthy Youth (MiPHY) survey is an anonymous computer-based survey administered to 7th, 9th, and 11th grade students by the Michigan Department of Education and collects information on health behaviors and related risk and protective factors.

For students in grades 9 and 11, the survey gathers information about recent MA, heroin, prescription painkillers, and cocaine use. For students in 7th grade, the survey gathers information about lifetime use of these substances.

Survey data was not available for Barry County from school year 2019/2020 due to Covid-related interruptions of the school year.

What are stimulants and opioids?

Stimulants are a class of drugs that speed up the messages between the brain and the body. They can make a person feel more awake, alert, confident or energetic.[1] Large doses of stimulants can cause over-stimulation, causing anxiety, panic, seizures, headaches, stomach cramps, aggression, and paranoia. Long-term use of strong stimulants can also cause several adverse effects.

Methamphetamine is a stimulant. Stimulants also include substances such as caffeine, nicotine, amphetamines, and cocaine. Although these stimulants have similar behavioral and physiological effects, methamphetamine (MA) remains in the brain longer, and results in a much higher level of dopamine resulting in greater potential for addiction.[i]

Methamphetamine is a powerful, highly addictive stimulant also known as meth, blue, ice, and crystal. Other characteristics of methamphetamine include:

- White, odorless, bitter-tasting crystalline powder that easily dissolves in water or alcohol.
- Consequences of MA misuse can be terrible for the individual—psychologically, medically, and socially.
- Using the drug can cause memory loss, aggression, psychotic behavior, damage to the cardiovascular system, malnutrition, and severe dental problems.
- Can be smoked, snorted, injected, or swallowed in pill form.

Opioids are a class of drugs that include the illegal drug heroin, synthetic opioids such as fentanyl, and pain relievers available legally by prescription, such as oxycodone (OxyContin®), hydrocodone (Vicodin®), codeine, morphine, and many others. Opioid pain relievers are generally safe when taken for a short time and as prescribed by a doctor, but because they produce euphoria in addition to pain relief, they can be misused. Regular use, even as prescribed by a doctor, can lead to dependence. Opioid misuse, including pain relievers can lead to addiction, overdose, and death.[ii]

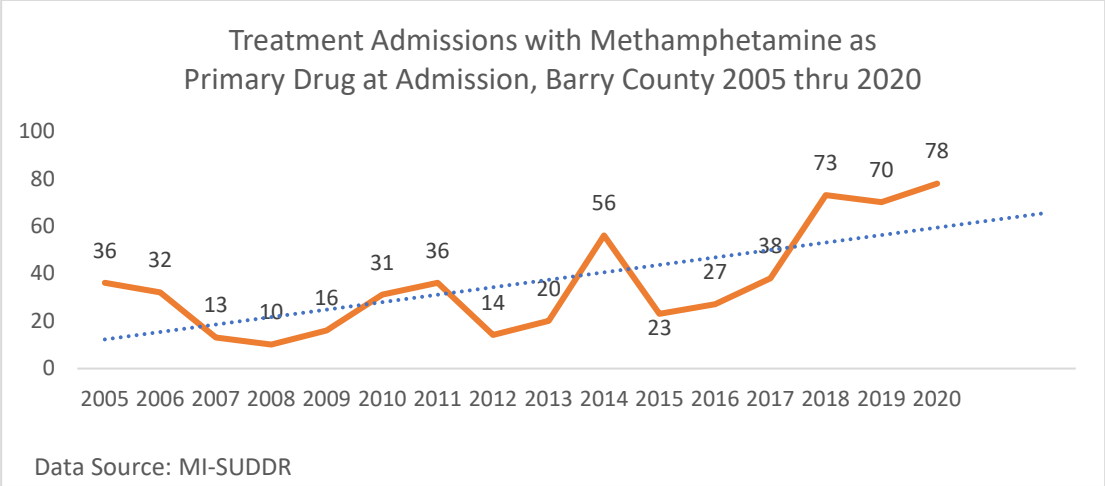
EVIDENCE OF A PROBLEM

Nationally, the demand to use illicit stimulants is rapidly increasing, unlike demand for opioids which has remained relatively stable. According to the National Survey on Drug Use and Health, the demand for stimulants has almost reached the same high levels as opioids. They report that new initiates (used for the first time in past twelve months) for cocaine, MA, and prescription (Rx) stimulants combined, rose to 2.4 million in 2017, which was about the same level as new initiates of heroin and Rx opioids.[iii]

In the early 2000's, MA was a significant problem in Michigan, primarily in southwestern counties who were at the forefront of addressing this problem through targeted prevention, treatment and enforcement efforts. Following state-wide legislation restricting the purchase of pseudoephedrine in 2004, use of MA issues decreased substantially but have reemerged in recent years. Opioids have been a primary focus for prevention and treatment efforts in recent years but appears to be on the decline.

Admissions to publicly funded treatment also indicate a growing problem. Between 2015 and 2019 admissions for Barry County residents with MA as the primary drug increased more than three-fold, and more than double admissions in 2005. In 2018, methamphetamine surpassed admissions for marijuana as well as for heroin and prescription opioids. In 2020, admissions for methamphetamine surpassed those for alcohol. In comparison, admissions for heroin and prescription opioids never exceeded admissions for alcohol and have been decreasing steadily since FY2016.[5]

In 2004, federal and state regulations were put in place to make access to ingredients for MA production more difficult to obtain. Communities also worked to stop the spread of MA use through education programs, increased law enforcement efforts, and addiction treatment programs.

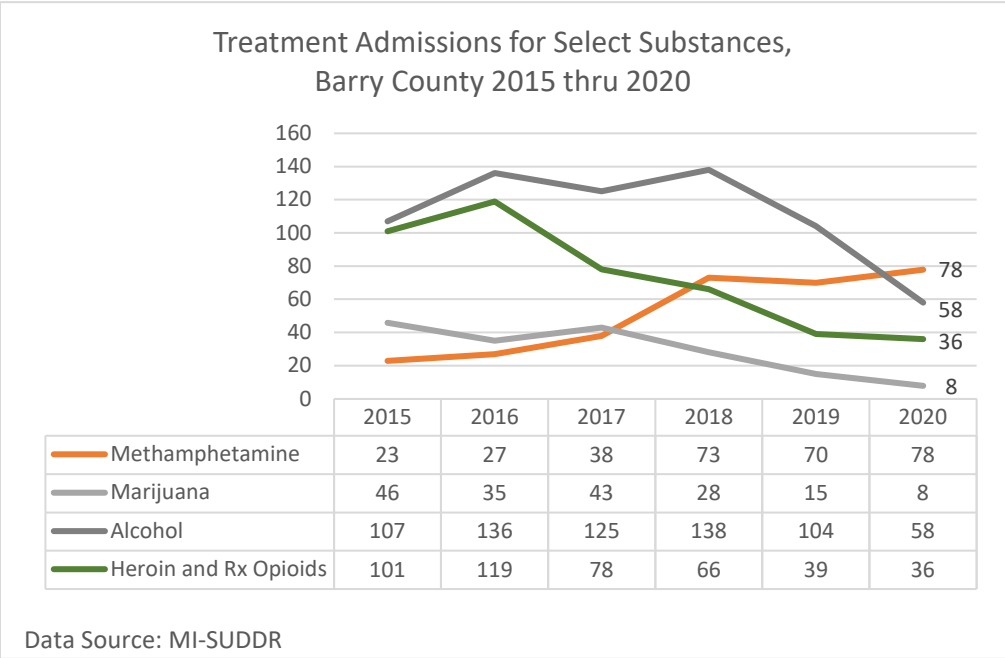


[5] www.Mi-suddr.com

Trends in Treatment Admissions

Following regulations in 2004, treatment admissions for MA declined. In recent years, admissions for MA have increased dramatically and in 2020 were twice the number occurring in 2005.

During this same period, treatment admissions with an opiate identified as the primary drug began increasing between 2009 through 2013, followed by a decline starting in 2017. In 2020, Barry County had a total of 36 admissions with heroin or a prescription opioid as the primary drug.



	2015	2016	2017	2018	2019	2020
Methamphetamine	23	27	38	73	70	78
Marijuana	46	35	43	28	15	8
Alcohol	107	136	125	138	104	58
Heroin and Rx Opioids	101	119	78	66	39	36

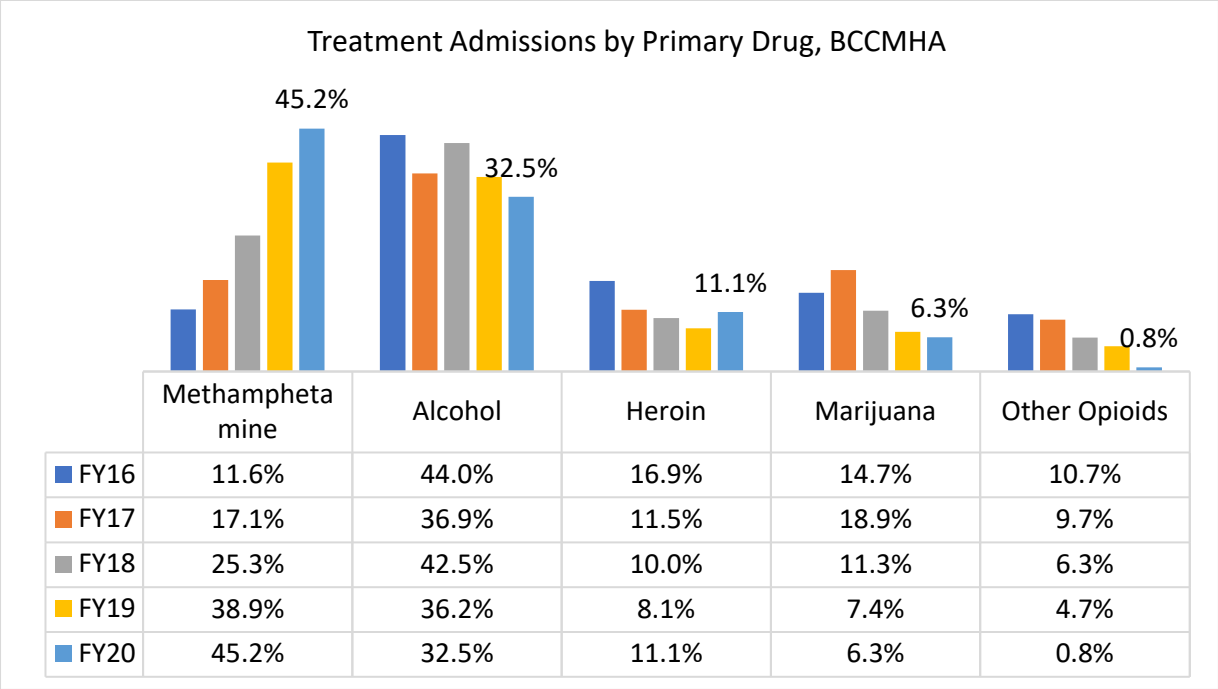
Data Source: MI-SUDDR

In comparison to admission for other substances, alcohol has historically accounted for the greatest number of treatment admissions, followed by heroin and other opioids. However, in 2018, MA surpassed admissions for heroin and prescription opioids as well as marijuana. In 2020, admissions for MA represented the largest number of admissions, surpassing even alcohol.[6]

When admissions to BCCMHA were calculated as a percent of all admissions, almost half of treatment admissions reported MA as the primary drug of choice (45.2%) in FY20, compared to one-third for alcohol (32.5%), and slightly more than one-in-ten (11.9%) for opioids.

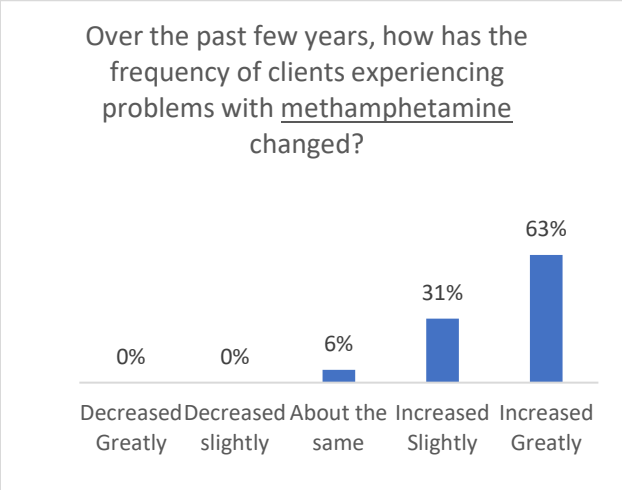
[6] www.Mi-suddr.com

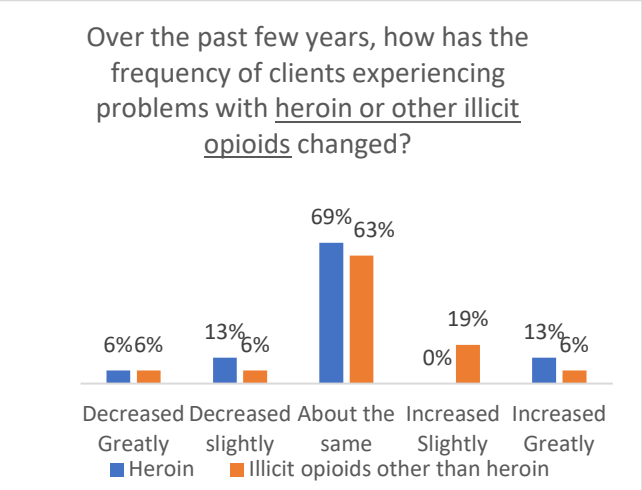
- In FY16, admissions with MA reported as the primary drug accounted for 11.6% of admissions to BCCMHA, increasing to 45.2% in FY20.
- In FY20, heroin or a prescription opioid as the primary drug accounted for 11.9% of all admissions to BCCMHA. Heroin accounted for the majority of these admissions (14 out of 15 admissions).



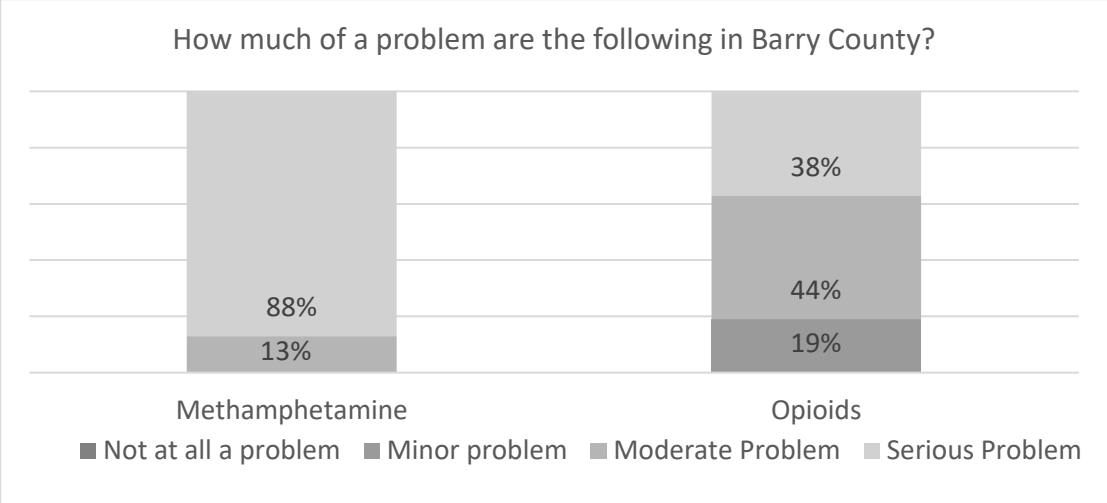
	Methamphetamine	Alcohol	Heroin	Marijuana	Other Opioids
FY16	11.6%	44.0%	16.9%	14.7%	10.7%
FY17	17.1%	36.9%	11.5%	18.9%	9.7%
FY18	25.3%	42.5%	10.0%	11.3%	6.3%
FY19	38.9%	36.2%	8.1%	7.4%	4.7%
FY20	45.2%	32.5%	11.1%	6.3%	0.8%

When substance use disorder clinicians were asked, almost all (94%) reported an increase in clients experiencing problems with MA in recent year; almost two-thirds (63%) reporting it has increased greatly.





When clinicians were asked how much of a problem these substances are in their county, 88% reported that MA is a 'serious problem' compared to 38% for opioids, and 13% for cocaine. None of the clinicians reported that MA is not a problem, or only a minor problem.



Primary vs. Non-Primary Drug of Choice

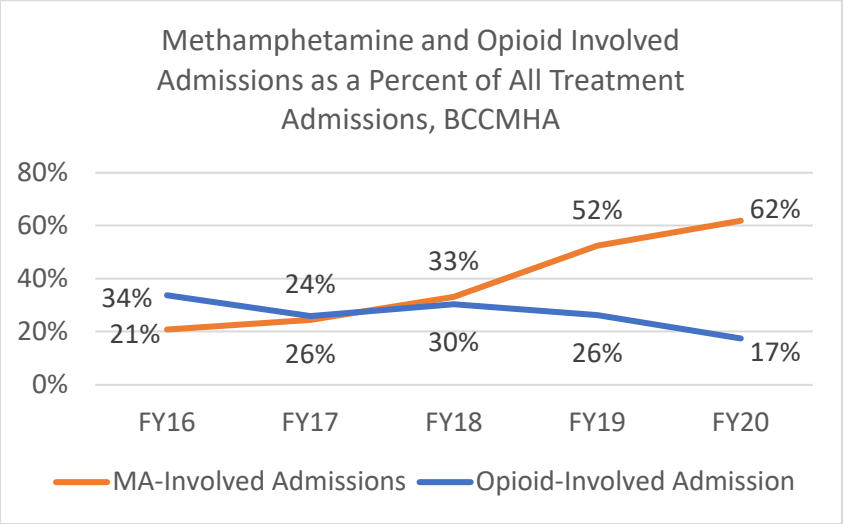
MA-involved admissions have tripled since FY16, accounting for almost two-thirds of treatment admissions in FY20. Data analysis related to treatment admission trends primarily relies on primary drug at admission, while the prevalence of these substances is sometimes less noticeable.

Opioid-involved admissions have decreased since FY16 with 17.5% of admissions involving an opioid in FY20.

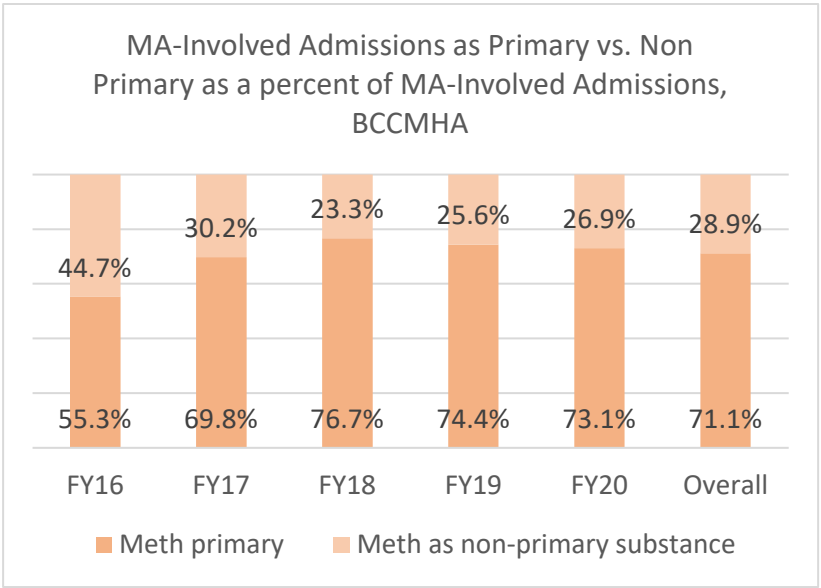
Note:
When an admission **involves** a substance, this means the substance was reported as a primary, secondary, or tertiary drug of choice at admission.

Primary = primary drug of choice

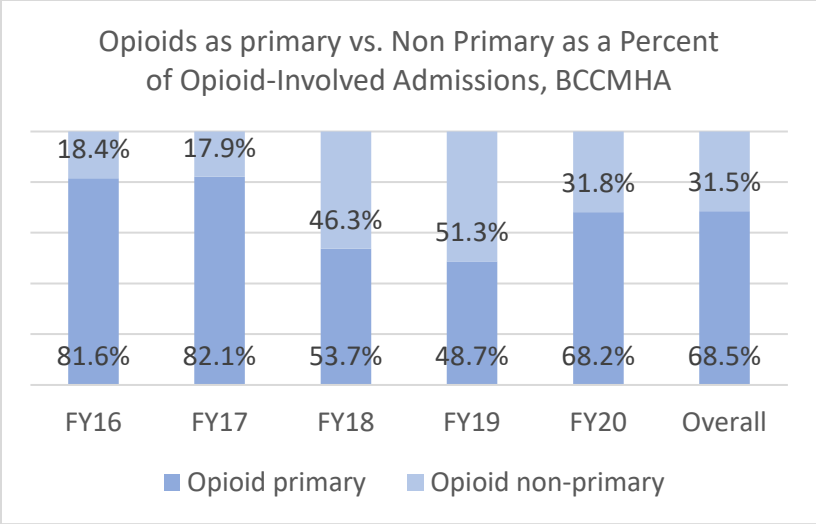
Non-Primary = Secondary or tertiary drug of choice



The proportion of MA involved admissions increased between FY16 and FY18 and has decreased slightly through FY20. During this period, opioid involved admissions have declined.



The proportion of opioid-involved admissions with an opioid reported as primary was highest in FY16-17 at around 80% with a decrease in FY18 and 19 to around 50%, increasing slightly in FY19 and 20 to almost 70%.

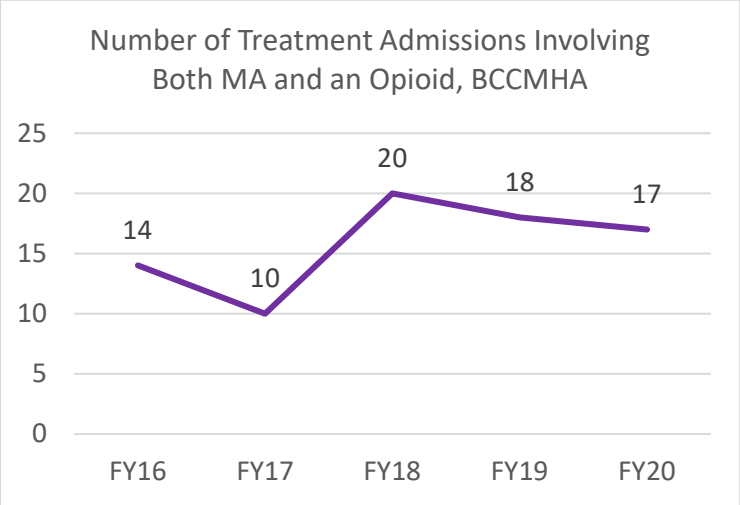


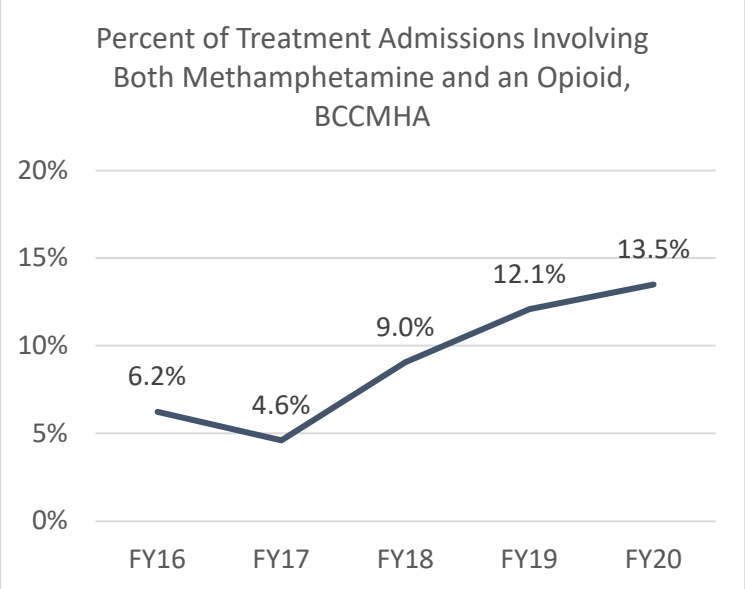
Stimulant and Opioid Polysubstance Use

The Center for Disease Control has noted a growing polysubstance landscape and specifically called out the combination of opioids and stimulants as a serious concern.

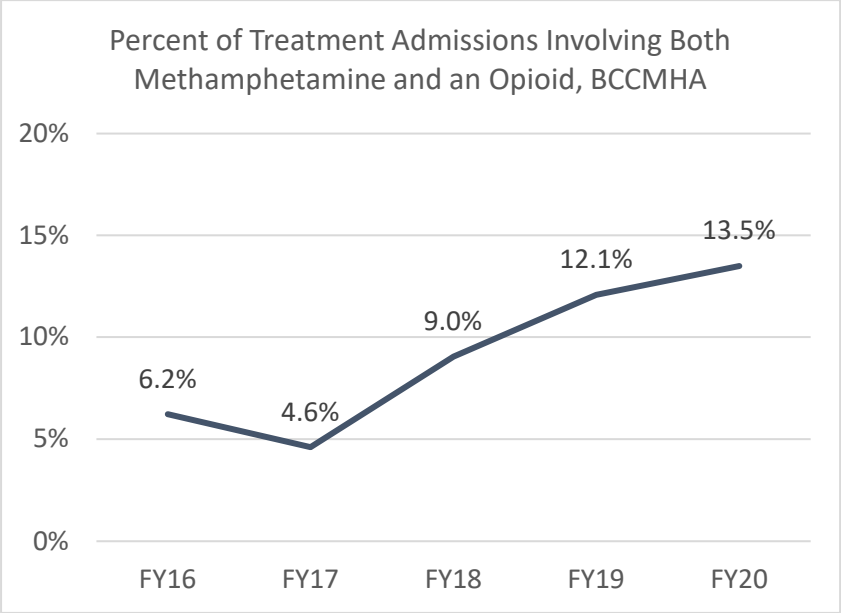
Locally, the number of admissions that involved both MA and an opioid have increased slightly in recent years.

When considered as a percent of all admissions, there appears to be an increasing trend with these admissions accounting for 13.5% of all admissions in FY20, compared to only 6.2% in FY16 and 4.6% in FY15.



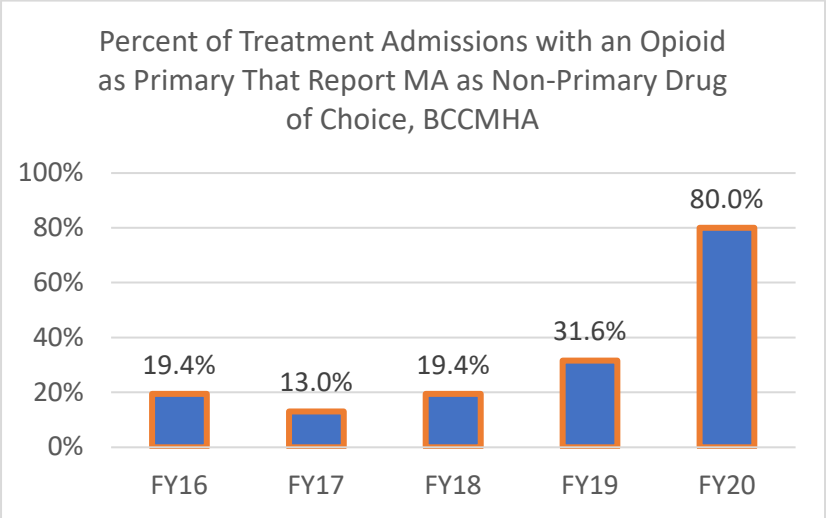


As programs work to address the opioid epidemic, it is important to note that MA use has been increasing among clients admitted with an opioid as their primary drug.



Overall, in Barry County between FY16 and FY20, 24% of admissions with an opioid as primary reported MA as a non-primary drug of choice.

Between FY18 and FY20, this has increased substantially with 80% of admissions for opioid as primary reporting methamphetamine as a non-primary drug of choice in FY20.



OVERDOSE DEATHS

According to the CDC, "Psychostimulants with abuse potential include drugs such as methamphetamine (MA), MDMA, dextroamphetamine, levoamphetamine, methylphenidate (Ritalin), and caffeine."

According to NIDA, most overdoses involving a psychostimulant with abuse potential involve MA. [i]

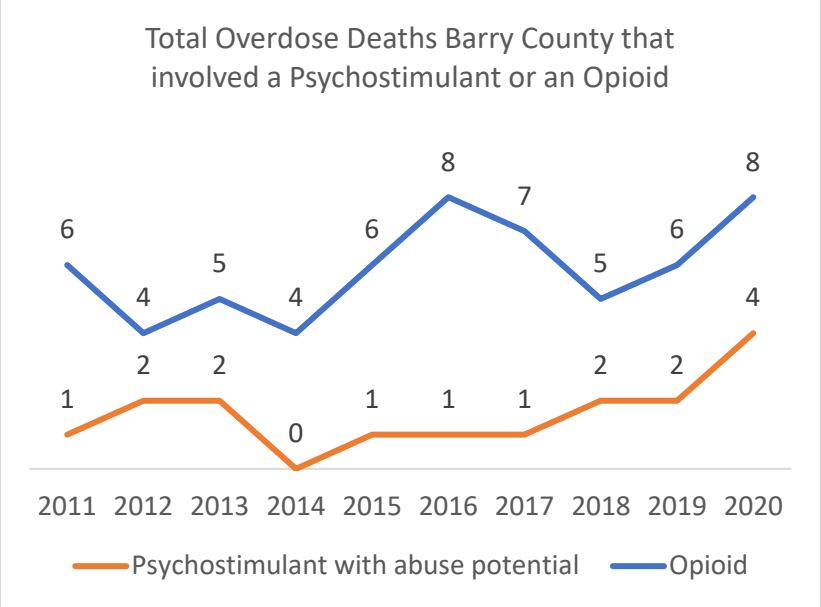
Note:

Combining opioids with stimulants can increase risk of overdose and lower the effectiveness of naloxone. [xxv]

Overdose Deaths in Barry County by Substance Involvement

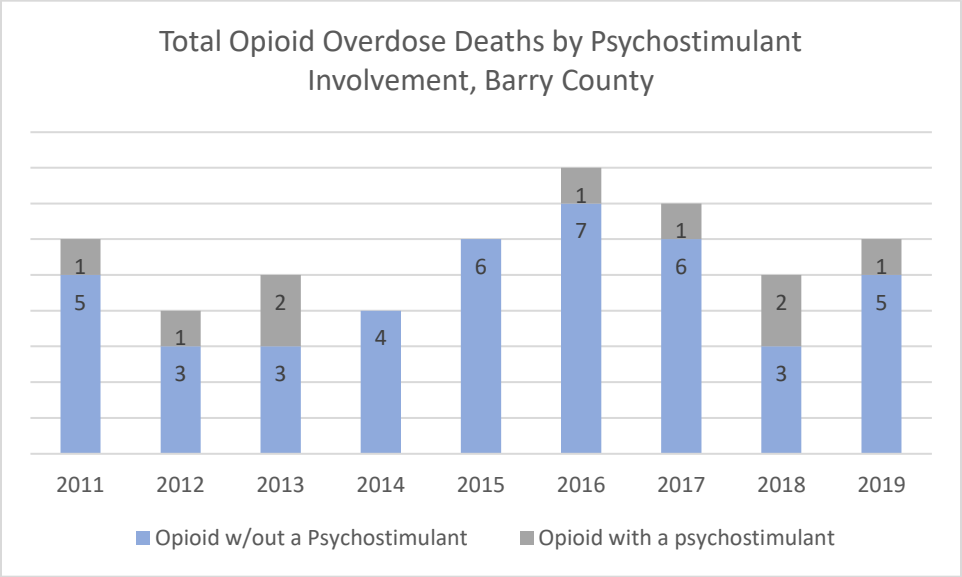
	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	TOTAL
Psychostimulant with an opioid	1	1	2	0	0	1	1	2	1	2	**11**
Psychostimulant without an opioid	0	1	0	0	1	0	0	0	1	2	**5**
Total with a Psychostimulant with abuse potential	1	2	2	0	1	1	1	2	2	4	**16**
Total Overdose deaths that involved an Opioid	6	4	5	4	6	8	7	5	6	8	**59**
Total Overdose deaths	**7**	**7**	**6**	**5**	**8**	**10**	**7**	**6**	**7**	**12**	**75**

Between 2011 and 2020 there were 16 deaths for Barry County residents that involved a psychostimulant with abuse potential. Of these, 11 also involved an opioid and 5 did not.[iv,v,vi]



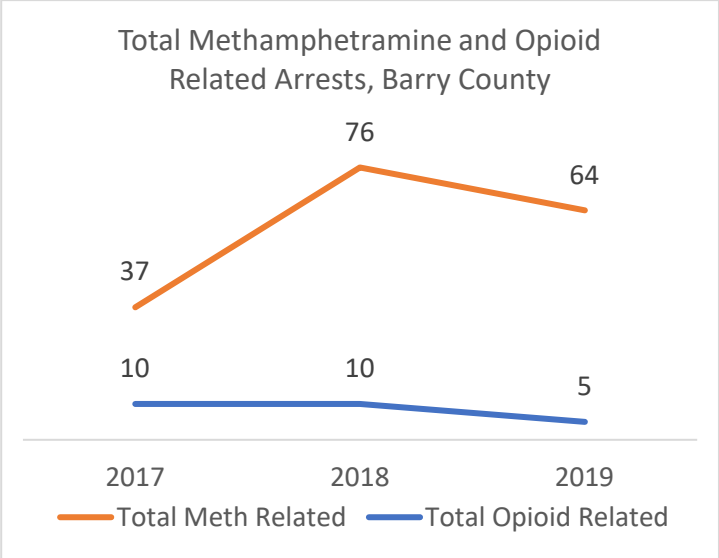
Of the 75 overdose deaths in Barry County between 2011 and 2020:

- 59 involved an opioid
- 16 involved a psychostimulant with abuse potential
- 11 involved both an opioid and a psychostimulant

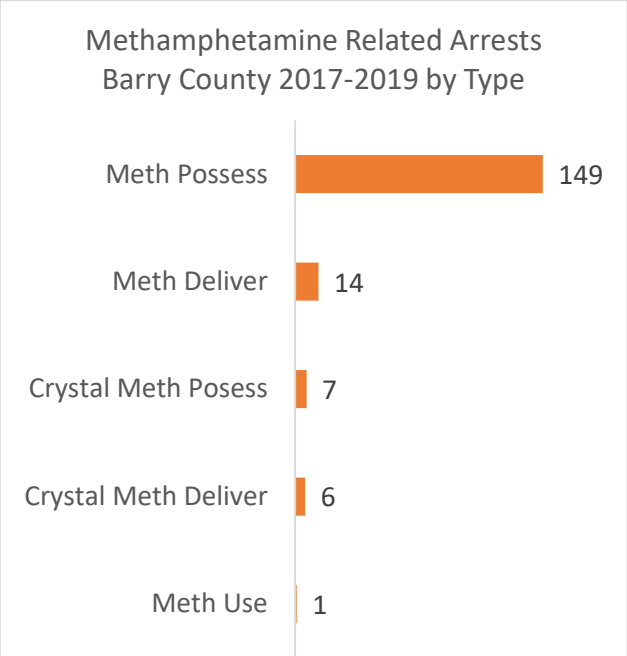


METHAMPHETAMINE AND OPIOID RELATED ARRESTS

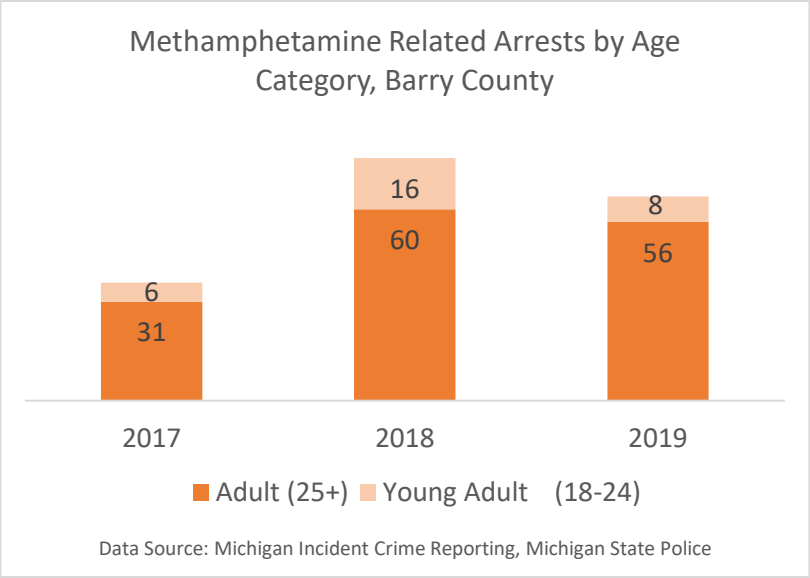
In Barry County, MA related arrests increased since 2017 with a total of 177 MA related arrests between 2017 and 2019. Opioid related arrests remain low and decreased in 2019.

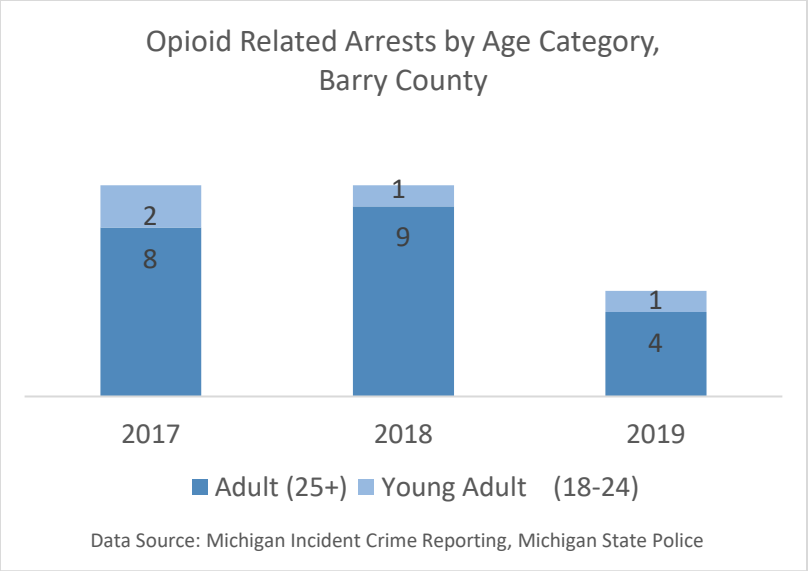


MA and opioid related arrests in Barry County were primarily for possession. In recent years, there have been no arrests for manufacturing methamphetamine or a meth lab in Barry County.



MA and opioid related arrests are primarily occurring among adults age 25 or older. There were no arrests of minors under the age of 18 for methamphetamine or opioid related arrests between 2017 and 2019 in Barry County.





AVAILABILITY

According to the National High Intensity Drug Trafficking Areas Emerging Threat (NETI) report in 2018, "Trafficking in illicit stimulants and prescribing of prescription stimulants have both increased over the past 7 years, along with increasing demand for illicit stimulants and non-medical use of Rx stimulants."[vii]

> *There is an overabundance of methamphetamine in Barry County.*
>
> Mental Health & Addiction Counselor, Barry County

The NETI 2018 report indicates that the majority of MA seized in the U.S. comes from Mexican Drug trafficking organizations (DTOs) that continue to use the P2P method in response to the ban on pseudoephedrine in Mexico.

According to NETI 2018:

- Street prices have decreased because DTO's have improved potency and increased production.
- DTOs often conceal MA in solution to avoid detection at the border and smuggle larger quantities.
- Most clandestine MA labs that produce MA within United States are small "user-type" that produce under 2 ounces per batch.

Data was requested from HIDTA for seizures occurring in Barry County for the years of 2015 through 2020 to better understand the local availability of stimulants and opioids. HIDTA seizure data reflects the seizures reported by Michigan HIDTA initiatives (drug teams).

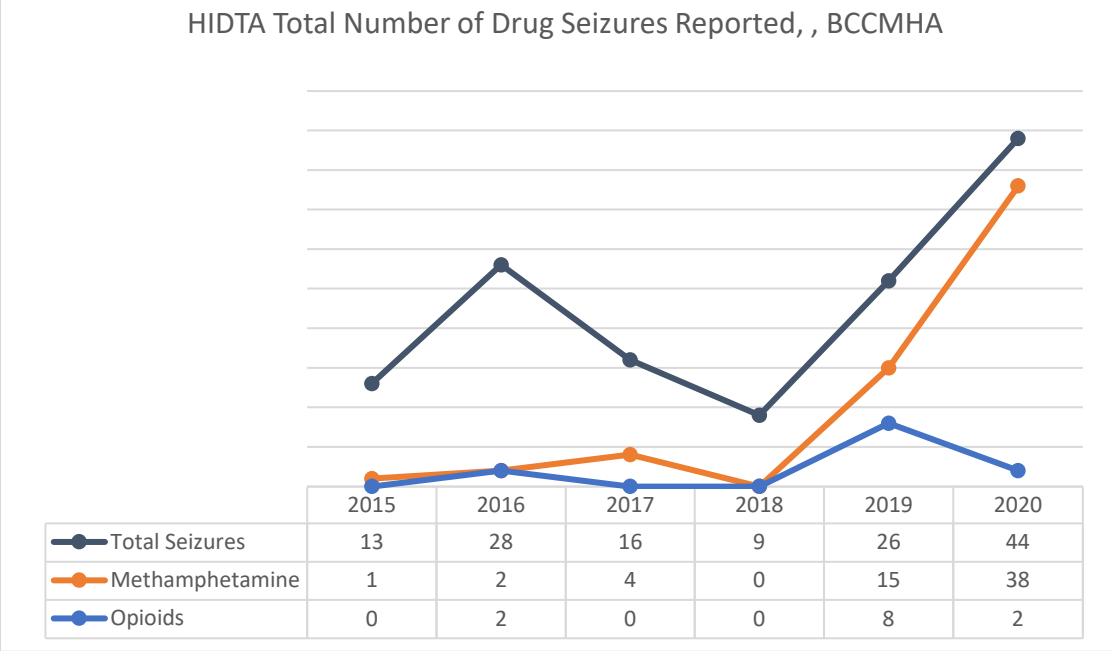
As noted by HIDTA, seizure data serves as a surrogate measure for the supply and availability of local illicit substances. It is not a direct measure of substance availability and the quantities of drugs seized vary with the changes in illegal drug supply because law enforcement intentionally focuses investigations and seizures on those drugs most frequently trafficked.[vi] Data provided by HIDTA does not

> When asked what the biggest challenge treating clients addicted to methamphetamine, one case manager noted, *"The ease at which they can access it and common relapse."*
>
> SUD Case Manager, Barry County

include seizures conducted by other federal, state, or local law enforcement agencies as HIDTA does not collect data from non-HIDTA funded drug teams. HIDTA does not support a team in Barry County.

In Barry County there have been a total of 60 drug seizures involving methamphetamine since 2015. The number of HIDTA drug seizures involving methamphetamine increased from 1 in 2015 to 38 seizures in 2020, accounting for 86% of the seizures occurring in the county that year.

Seizures of opioids in Barry County have remained comparatively low with a total of 12 seizures between 2015 and 2020. In 2020, both opioid seizures were for fentanyl.



	2015	2016	2017	2018	2019	2020
Total Seizures	13	28	16	9	26	44
Methamphetamine	1	2	4	0	15	38
Opioids	0	2	0	0	8	2

HIDTA drug seizures for MA during this period totaled 0.6981 kg, with the largest amount seized in 2019 and 2020. Of the 60 methamphetamine seizures occurring between 2015 and 2020, 90% were for methamphetamine in the form of 'ice'. In 2020, the amounts of 'ice' seized ranged from a low of 0.001 to 0.1187 kg in 2020. With a dose of 'ice' estimated at .001 kg, this represents seizures ranging from 1 dose to 119 doses.[7]

[7] ICE FORMS AND USE.pdf (unsw.edu.au), the National Drug and Alcohol Research Centre, University of New South Wales, 2006. retrieved 89/2/21 via https://ndarc.med.unsw.edu.au/sites/default/files/ndarc/resources/ICE%20FORMS%20AND%20USE.pdf

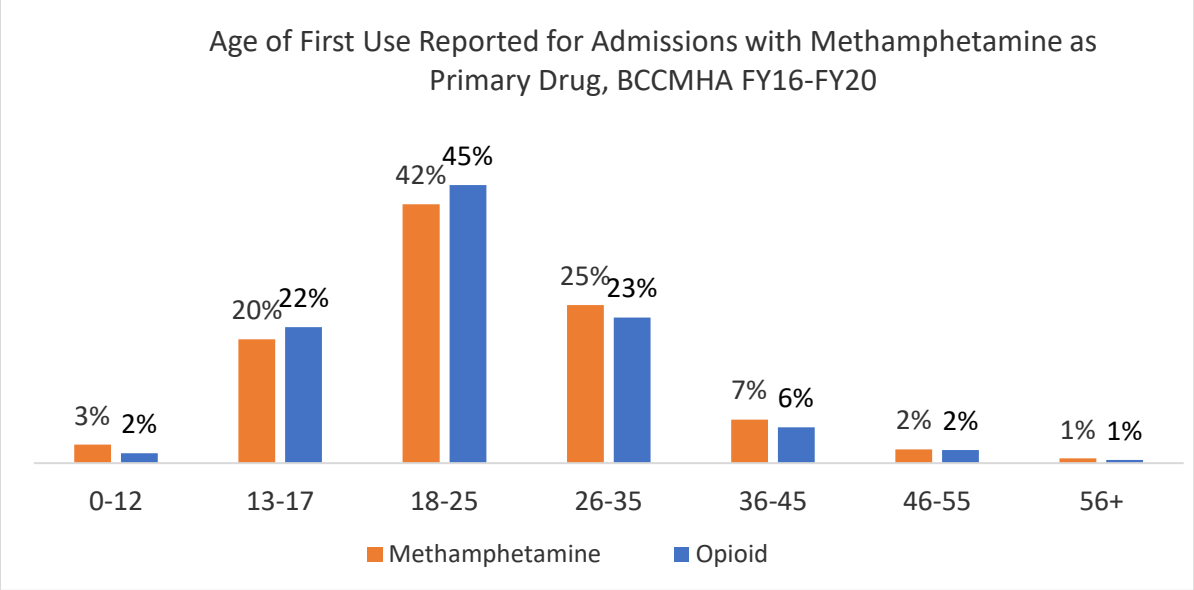
TREATMENT EPISODE CHARACTERISTICS

An analysis of data for admissions to Barry County Community Mental Health Authority for publicly funded SUD treatment is provided in this section. The goal of this information is to provide a better understanding of the characteristics of individuals experiencing MA and opioid use disorders.

AGE OF INITIATION:

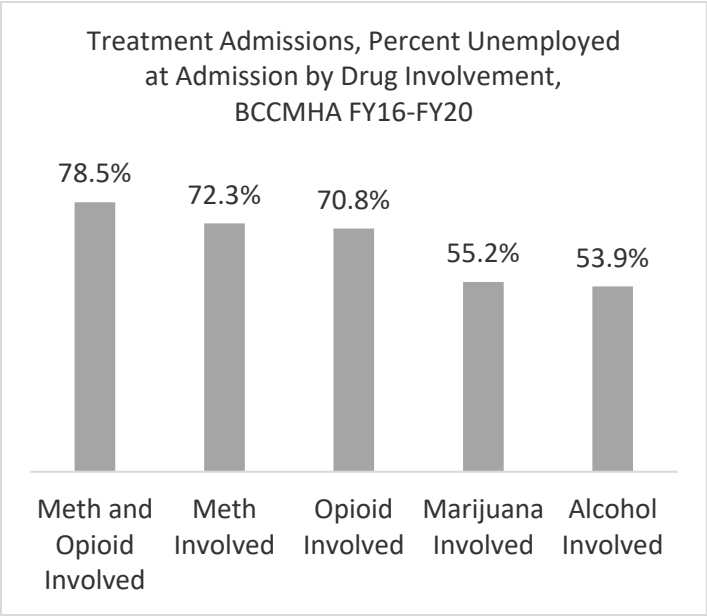
Among admissions with MA reported as primary drug, the median age of first reported use was 22, and the average age of first use was 24 years of age. Opioids also had a median age of first reported use of 22 and the average age was 24.

Individuals with MA or an opioid as their primary drug were most likely to report first use between the ages of 18-25, followed by 26-35. It should be noted that almost one-in-four admissions reported first use of these substances before the age of 18.



EMPLOYMENT:

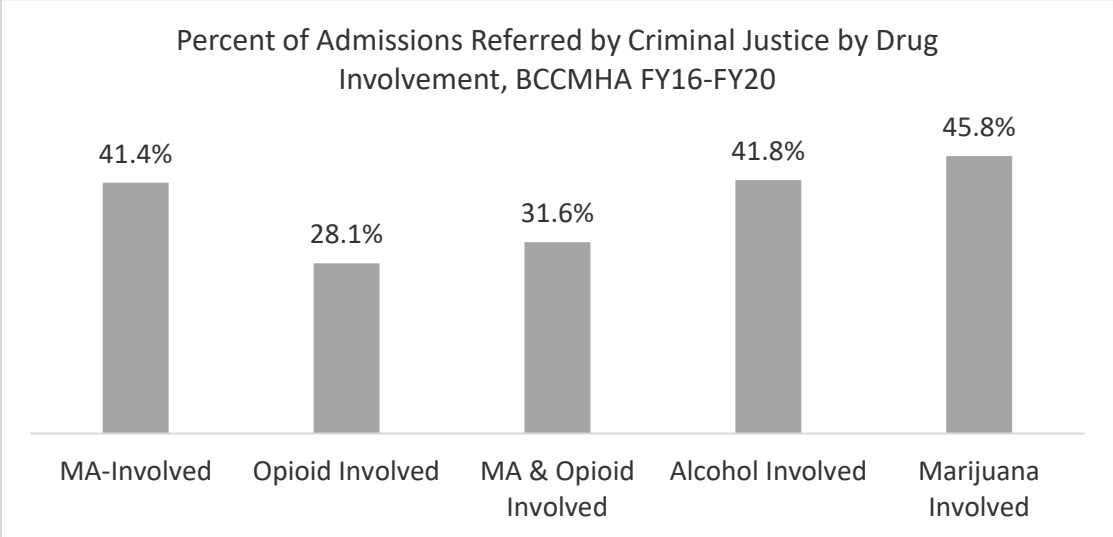
Admissions involving methamphetamine (MA) and opioids were more likely to report being unemployed at admission. Overall, for FYs 16-20, 72% of MA involved admissions reported being unemployed at admission compared to 53% for admissions with no MA involved. Similarly for opioids, 71% of opioid involved admissions reported being unemployed at admission compared to 55% for those with no opioid involvement.



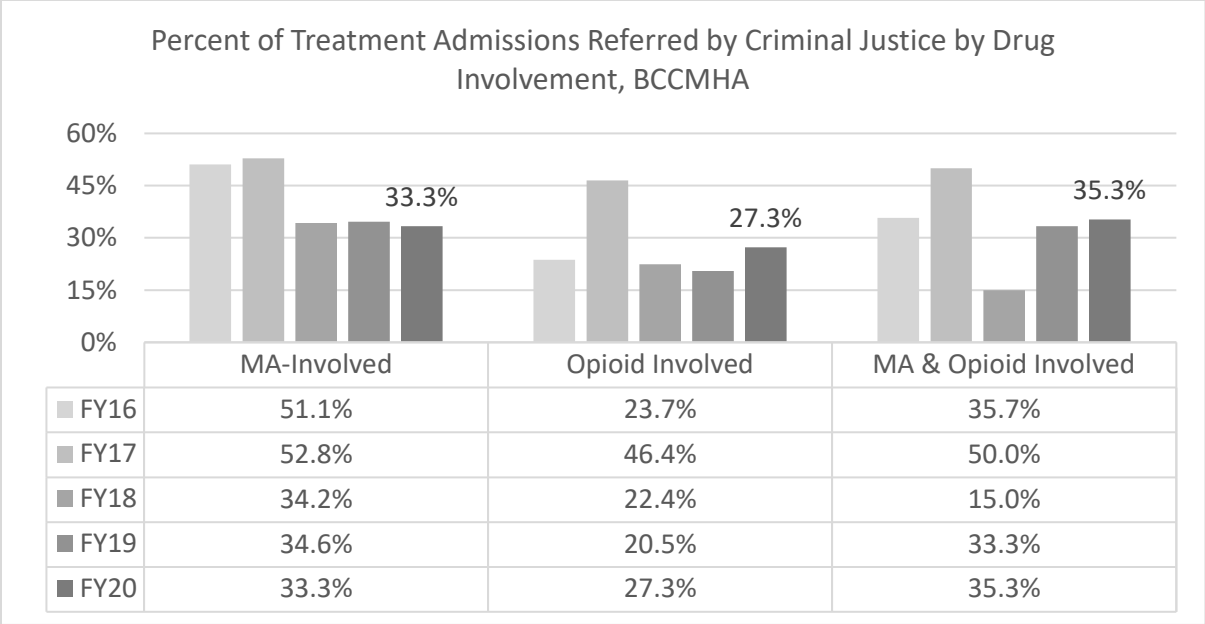
Unemployment was higher for MA and opioid involved admissions, with the highest rate for those reporting both MA and opioid use. Rates of unemployment were also higher for individuals using MA and/or opioids than for marijuana or alcohol.

CRIMINAL JUSTICE INVOLVEMENT:

Two-fifths of MA-involved admissions (41%) were referred by the criminal justice system, similar to rates for alcohol and slightly lower than for marijuana. Opioid-involved admissions had a lower rate of referral from criminal justice at 28%.



The percent of MA and opioid involved admissions referred by the criminal justice system decreased in FY18. For MA, around one-third of admissions have been referred by the criminal justice in recent years, compared to around 50% in FYs 16 and 17. Opioid involved admissions referred by the criminal justice system decreased to around one-fifth of admissions in FY18 and increased slightly in FY 20 to just over one-in-four (27%) in FY20.



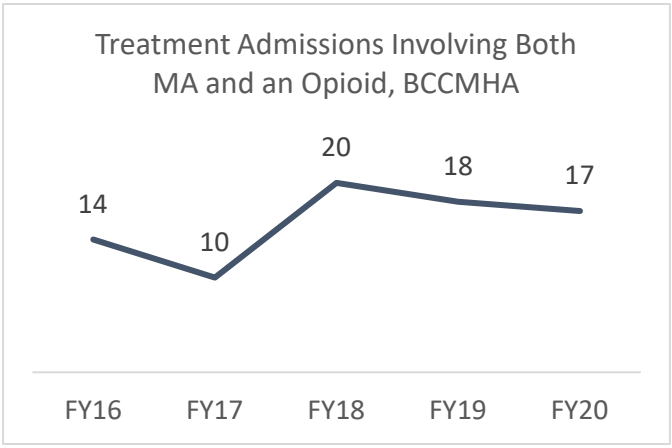
	MA-Involved	Opioid Involved	MA & Opioid Involved
FY16	51.1%	23.7%	35.7%
FY17	52.8%	46.4%	50.0%
FY18	34.2%	22.4%	15.0%
FY19	34.6%	20.5%	33.3%
FY20	33.3%	27.3%	35.3%

Opioid and Stimulant Polysubstance Use:

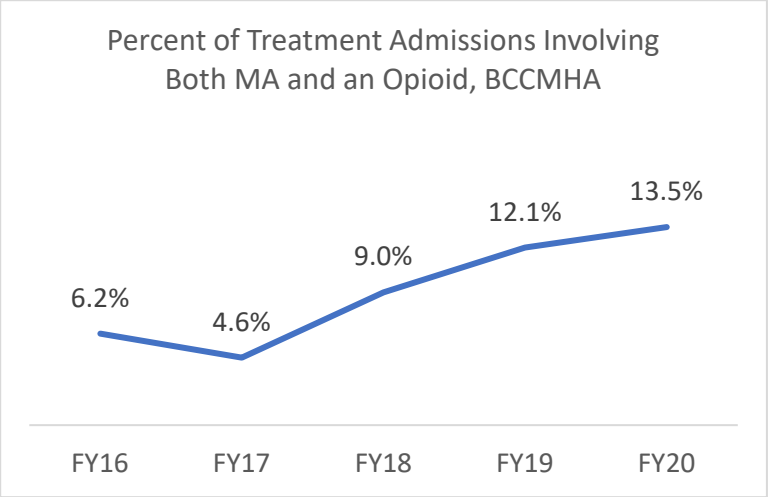
Between FY16 and FY20, there were 79 admissions to BCCMHA involving both MA and an opioid.

Note:

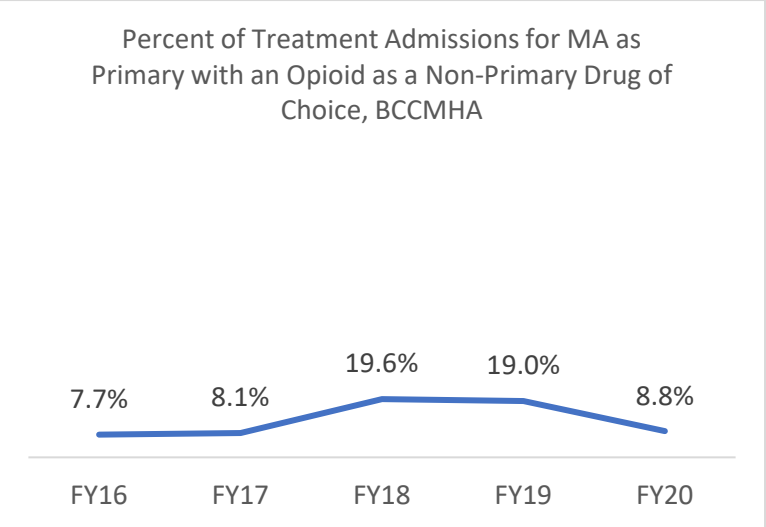
Although effective medications for opioid use disorder (OUD) exist, the lack of comparable treatments for stimulant addiction complicates the path to recovery for those using multiple substances.[i]



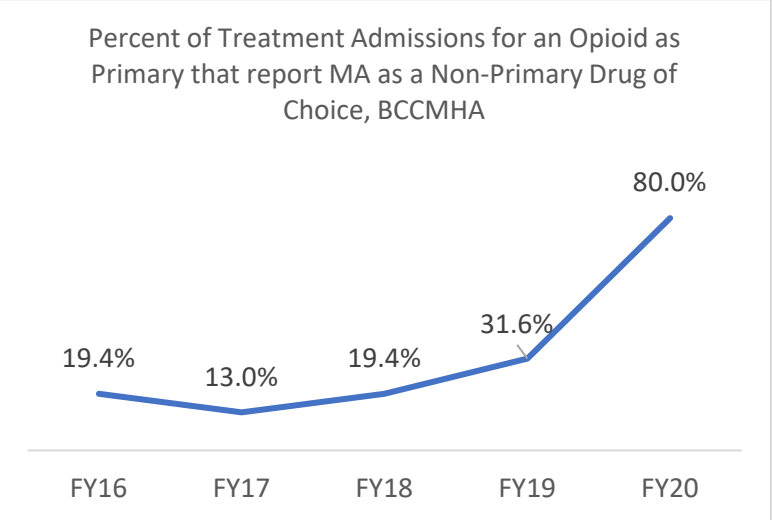
When considered as a proportion of all admissions there has been a steady increase in admissions involving both MA and an opioid. In FY20, these admissions accounted for 13.5% of Barry County admissions, compared to only 4.6% in FY17.



In FY20, 8.8% of clients who reported MA as their primary drug, reported an opioid as a non-primary drug of choice. The highest rates occurred in FY18 and FY19.

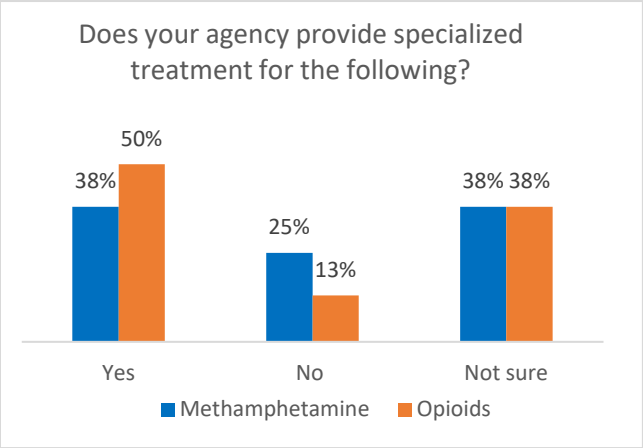


In FY20, 80% of individuals who reported an opioid as their primary drug reported MA as a non-primary drug of choice, increasing continually since FY17 with the greatest increase occurring between FY19 and FY20.



TREATMENT OUTCOMES

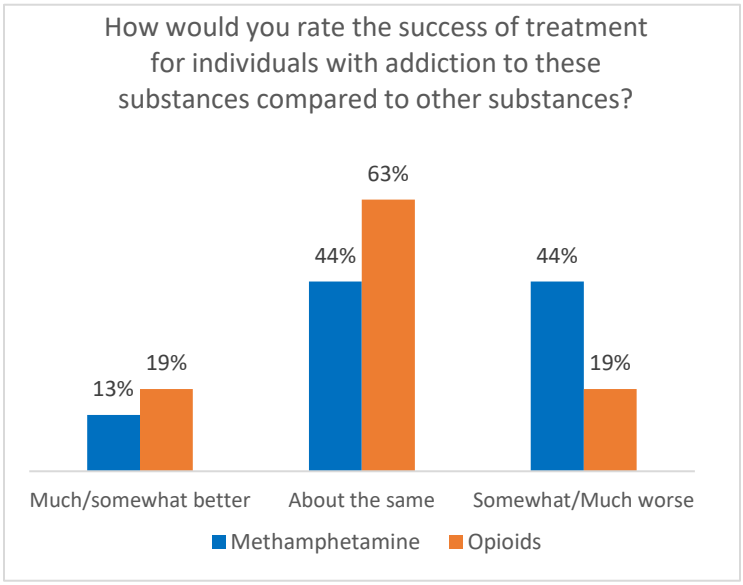
Almost half of clinicians surveyed (44%) reported that treatment outcomes for methamphetamine (MA)-involved treatment episodes were somewhat or much worse than for other drugs. Another 44% reported that treatment outcomes are similar to other drugs. For opioids, clinicians were more likely to report that outcomes were similar to other drugs (63%) or better than for other substances (19%).

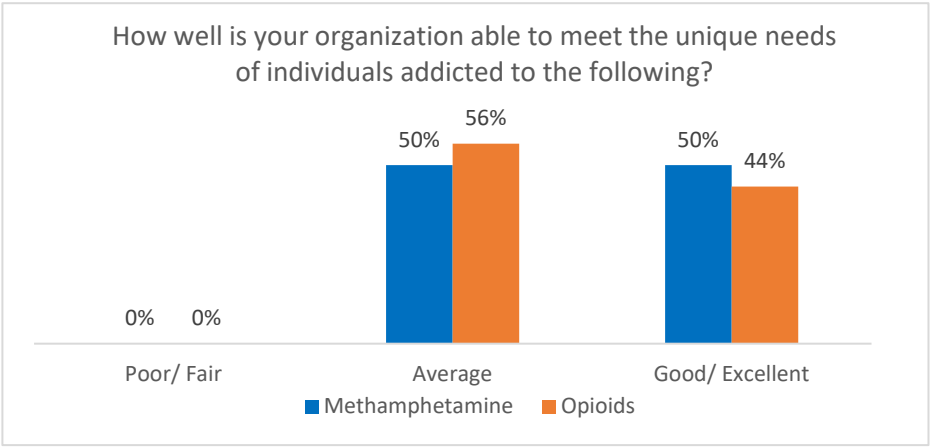


When asked whether their agency provided specialized treatment for individuals addicted to MA, half of the respondents reported that they do, and more than one-third reported they were not sure.

When asked how well their organization is able to meet the unique needs of individuals addicted to MA, half (50%) reported 'good/excellent', and the remainder reported 'average'.

Slightly less reported their organization is 'good/excellent' at addressing the unique needs of individuals addicted to opioids (44%).



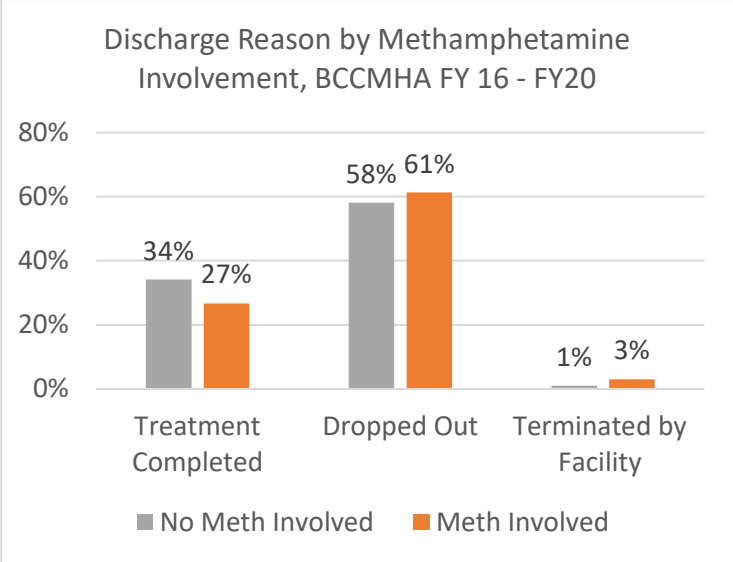


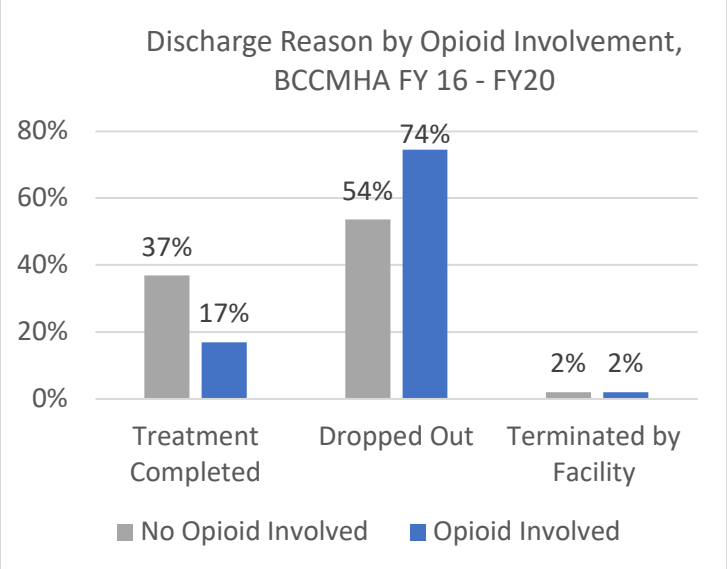
DISCHARGE REASON:

Reason for discharge has been analyzed as a surrogate measure for treatment success. Discharges identified with the reason of 'Transfer to another program/Completed Level of Care' have been excluded from this analysis because they do not represent an end of a treatment episode, but rather a transition to a different level of care.

For this analysis, the discharge reason 'Completed Treatment' is being considered to indicate a positive treatment outcome while 'Dropped Out' is being considered to indicate a poor treatment outcome. No discharges were reported in Barry County with the reason 'Terminated by Facility' which would also be considered to indicate a poor treatment outcome.

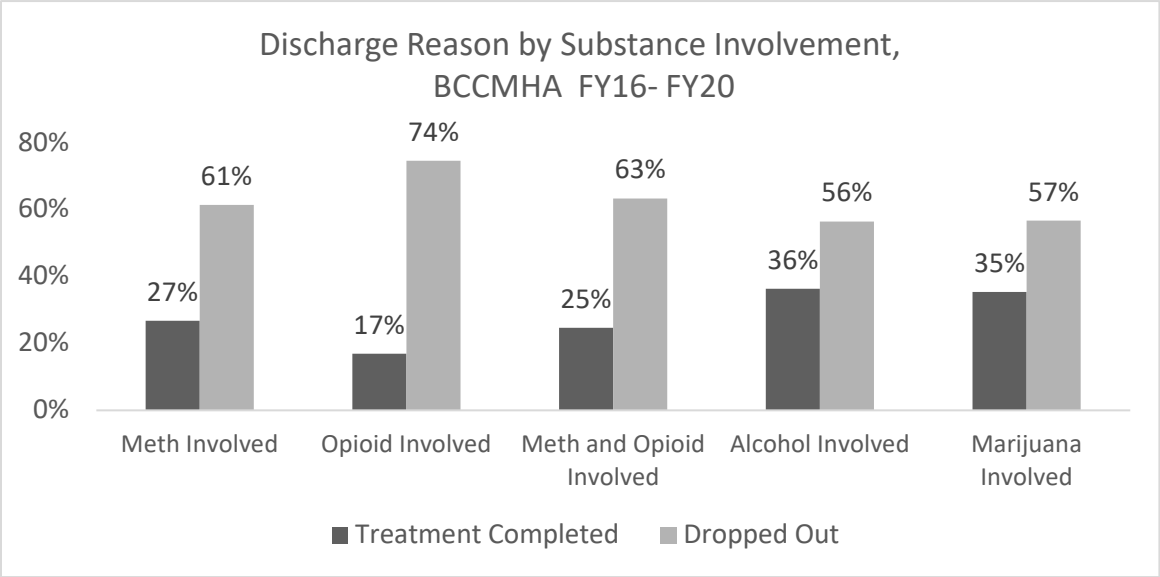
Both MA and opioid involved admissions were slightly less likely to 'complete treatment' and slightly more likely to 'drop out' than admissions without these substances involved.





When compared to alcohol and marijuana, opioid involved admissions were the most likely to be discharged as 'Dropped out' and least likely to be reported as 'Completed Treatment'.

MA-involved admissions were slightly more likely to be discharged as 'dropped out' and less likely to be discharged as 'Completed Treatment' than those involving alcohol or marijuana.



TREATING METHAMPHETAMINE USE DISORDERS

CHALLENGES IDENTIFIED:

According to clinicians and case managers for the Specialty Court in Barry County, clients entering treatment for methamphetamine (MA) present with numerous challenging issues that complicate treatment. Clinicians noted that these individuals often present with a history of trauma, relationship issues, and little or no family support or support systems in general.

In addition, they often present with financial struggles, housing and employment instability, medical and dental issues, and criminal justice system involvement.

> *"It can be difficult to break the cycle due to limited supportive resources in Barry County for substance use disorder."*
>
> SUD Access Clinician, Barry County

Additional unique complications such as MA induced psychosis and aggression complicate treatment.

Clinicians noted that a lack of ancillary services makes it difficult for these individuals to avoid relapse.

Clinicians also noted that there is a lack of supportive sober housing in the region. In addition, there is limited access to residential treatment programs, and the services available have a short duration which is not adequate to address the needs of these individuals.

For individuals in jail, there is very little access to treatment and no medication assisted treatment (MAT) is available.

A Department of Corrections, Field Services Supervisor noted that "These clients are becoming poly addicted due to methamphetamine or Fentanyl or even heroin being laced into the cocaine which adds a layer of difficulty in treatment to the addiction."

PROVIDER SUPPORT NEEDED

When clinicians were asked what **would most help improve treatment outcomes** for clients who use methamphetamine (MA), their responses indicate the need for:

- Safe, stable, and sober recovery housing; including support for those leaving jail to meet probation criteria and avoid a return to an unsupportive environment.
- Transportation to appointments.
- Inpatient treatment options, with longer periods of care.

- Continued research on medication that could assist recovery.
- Social supports in the community.
- Acudetox
- Methamphetamine specific support groups.
- More recovery coaching and peer mentors.
- Additional trainings for clinicians and community partners.
- Ability to support an individual beyond discharge from treatment.
- MAT provided to inmates prior to release.

> *"When the people are ready and want to change, they will, with some help to overcome the obstacles and work a recovery program for the rest of their life."*
>
> SUD Clinician, Barry County

SUCCESSES:

Clinicians report that they are seeing successes in treating clients for methamphetamine addiction:

- Success when client's recovery program has multiple services in place in order to provide support, education and accountability.
- Success when using a team of people who can support, educate, and hold them accountable for their actions.
- Success with folks who get involved in a church and with those who have a mentor -- especially those clients who are younger; a parent figure (outside of the program) has made a huge difference.
- Success when attending consistent/regular appointments.
- Success when using evidenced based practices.

RECOMMENDED TREATMENT MODELS

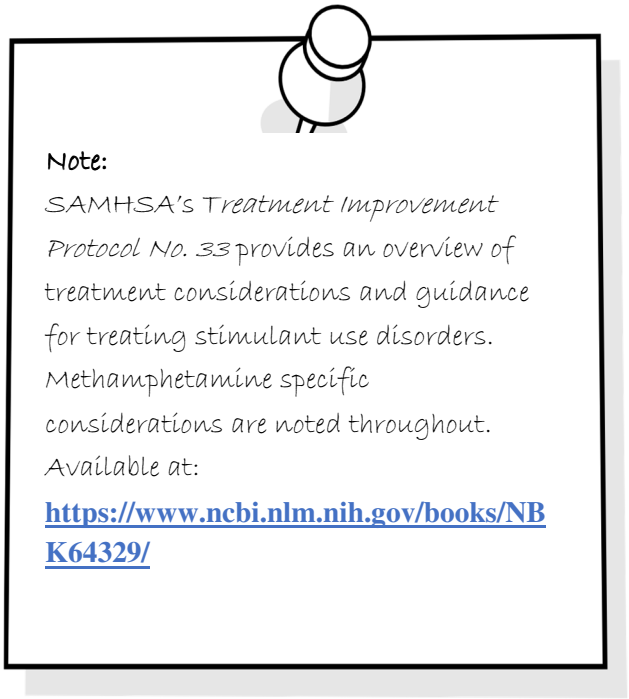
This content was compiled in 2020 for the Lakeshore Regional Entity. Any additional models or resources that have become available since that time will not be included.

Research indicates that the most effective treatments for MA addiction are behavioral therapies, such as cognitive-behavioral therapy, combined with motivational incentives, which uses vouchers or small cash rewards to encourage patients to remain drug-free.

Most commonly recommended treatment models include:

MATRIX MODEL OF COGNITIVE BEHAVIORAL THERAPY (CBT),

The Matrix Model incorporates principles of CBT in individual and group settings, family education, motivational interviewing, and behavioral therapy employing CBT principles. This manualized therapy has been proven more effective in reducing MA use during the 16-week the intervention than "treatment as usual".[viii]



The Matrix Model provides a framework for engaging stimulant users in treatment and helping them achieve abstinence. Patients learn about issues critical to addiction and relapse, receive direction and support from a trained therapist, and become familiar with self-help programs. Patients are monitored for drug use through urine testing.[ix]

The therapist functions simultaneously as teacher and coach, fostering a positive, encouraging relationship with the patient and using that relationship to reinforce positive behavior change. The interaction between the therapist and the patient is authentic and direct but not confrontational or parental. Therapists are trained to conduct treatment sessions in a way that promotes the patient's self-esteem, dignity, and self-worth. A positive relationship between patient and therapist is critical to patient retention.

Treatment materials draw heavily on other tested treatment approaches and, thus, include elements of relapse prevention, family and group therapies, drug education, and self-help participation. Detailed treatment manuals contain worksheets for individual sessions; other components include family education groups, early recovery skills groups, relapse

prevention groups, combined sessions, urine tests, 12-step programs, relapse analysis, and social support groups.

A number of studies have demonstrated that participants treated using the Matrix Model show statistically significant reductions in drug and alcohol use, improvements in psychological indicators, and reduced risky sexual behaviors associated with HIV transmission."[x]

CONTIGENCY MANAGEMENT:

Contingency management (CM) therapy for treatment of stimulant use disorders employs principles of reinforcement for demonstration of desired behaviors. The premise is that desired behaviors that replace or compete with drug use are followed by rewards to increase the frequency of these behaviors.

According to the National Institute on Drug Abuse (NIDA), research has demonstrated the effectiveness of treatment approaches using contingency management (CM) to enhance community-based treatment for substance use disorders. CM works by providing immediate and reliable reinforcement for remaining abstinent. This reinforcement helps to engage patients in treatment and promotes their abstinence which provides their brains a chance to heal. Studies have shown that incentive-based interventions are highly effective in increasing treatment retention and promoting abstinence from drugs.[xi]

To implement CM a specific, objective target behavior must be determined (e.g. abstinence from stimulants) and the target behavior must be measured objectively and frequently (e.g. twice weekly urine tests). Immediate tangible, desired reinforcement must be provided when the targeted behavior occurs. The size of the reinforcement should increase for consistent behavior. This results in continuous abstinence during treatment which is a strong and consistent predicter of long-term abstinence. Reinforcement is withheld when the target behavior does not occur (e.g. failed drug test) and the size of the reinforcement should be reset to the initial size for the next occurrence of the target behavior.

Contingency management typically uses either a voucher-based reinforcement or a prize incentive approach.

Voucher-Based Reinforcement (VBR), the patient receives a voucher for every drug-free urine sample provided. The voucher has monetary value that can be exchanged for food items, movie passes, or other goods or services that are consistent with a drug-free lifestyle. The voucher values are low at first and increase as the number of consecutive drug-free urine samples increases. A positive urine samples resets the value of the vouchers to the initial low value.

Prize Incentives CM applies similar principles as VBR but uses chances to win cash prizes instead of vouchers resulting in a lower cost to implement/ Over the course of the program (at least 3 months), participants supplying drug-negative drug tests draw from a bowl for the chance to win a prize worth between $1 and $100.

The number of draws increases with consecutive negative drug tests but resets to one with any drug-positive sample or unexcused absence.

The prize bowl contains 500 prize slips consisting of 250 "Good Job!", 209 "Small" ($1), 40 "Large" ($20), and 1 "Jumbo" ($100). Draw starts at 1 for the 1st negative sample and escalates (to a cap of ~8) with consistent abstinence. When abstinence is not verified, no draws are earned, and draws reset to 1 for the next negative sample. The average cost per patient for a 12-week period is ~$200.

Note:
Initially, concerns were raised that Prize Incentives may promote gambling which is a common co-occurring problem. It was found not to promote gambling.

Research indicates that contingency management may be effective in treating MA use disorder. Research conducted by NIDA, found that individuals receiving contingency management in addition to usual treatment, submitted significantly more negative drug tests and were abstinent for a longer period.[xii] One study applying the Prize Incentive CM for a 12-week period with cocaine and MA users in outpatient treatment found that CM improved retention and abstinence.[xiii]

ADDITIONAL TREATMENT CONSIDERATIONS

Medication Assisted Treatment: There are currently no government-approved medications to treat MA addiction. However, there are medications which may help to manage some of the symptoms that occur during the withdrawal process. Additional information about these medications is provided in the following section.

Initial Rest Period before therapy:

One of the biggest challenges in providing treatment for methamphetamine (MA)-dependent individuals is the difficulty in stabilizing and engaging a client in treatment initially.

> *"I think we need to be aware of any new treatments that are made available for this drug. I believe that meth is so much worse than any other drug out there. It causes serious damage to people and is extremely hard to stay clean."*
>
> Mental Health & Addiction Counselor, Barry County

The initial period of stimulant abstinence is characterized by symptoms of depression, difficulty concentrating, poor memory, fatigue, craving, and paranoia. [xiv] Depressive symptoms can be significant and associated with suicidal thoughts. Relapse often occurs due to feelings of depression, apathy, and hopelessness. During this period, extreme cravings occur but decline rapidly. Psychotic symptoms such as paranoia, hallucinations, and delusions, also occur and can be the most dangerous withdrawal symptom.[xv]

Withdrawal symptoms typically begin within 24 hours of abstinence and peak within the first 7-10 days. The average duration of symptoms lasts 14-20 days and cravings last at least 5 weeks.[xvi, xvii]

Research indicates that during the acute withdrawal phase (approx. 7-10 days), it may be best to let the individual sleep if they want to sleep without engaging in therapy. Research documents that during this acute phase, there is increased sleeping and eating, depression-related symptoms and, less severely, anxiety and craving-related symptoms. Oversleeping was marked during the acute phase and despite a reduction in sleep quality, was not followed by a period of insomnia during the subacute phase.[xviii] Patients are tired for 10-15 days of withdrawal; do not make them go to therapy sessions during that time if they want to rest. If they are incarcerated, this rest period can be done in jail.[xix]

Medications to Manage Withdrawal Symptoms:

The National Institute of Health notes that the severity of MA withdrawal symptomatology is likely to influence the ability of methamphetamine-dependent individuals to maintain abstinence. Therefore, reducing withdrawal symptoms may assist clients in remaining abstinent.[xx]

There are no medications approved by the FDA specifically designed to be used in the detox withdrawal process from MA. However, there are medications that can help to manage some of the symptoms that occur during withdrawal. However, research supporting the efficacy of medications to ease withdrawal symptoms is limited.[xxi]

Physicians are free to use any medications to address specific symptoms that occur in individuals during withdrawal. For instance, for individuals who develop psychotic-type behaviors, such as paranoia, physicians are free to administer antipsychotic medications if the symptoms are judged to be severe enough to require direct treatment. However, these drugs are not reimbursable by Medicaid as part of a medication assisted treatment method.[xxii]

Because most antidepressants do not begin to exert their effects until 2-4 weeks after initial administration, they may not be an effective means of coping with depression during the withdrawal process which typically resolves within 14 days.

Medications that may help manage withdrawal symptoms include:

- *Wellbutrin (bupropion)**: This drug is an antidepressant that has a good body of research indicating that it is useful in reducing the symptoms of withdrawal from crystal meth as it appears to reduce cravings. It may be more appropriate for light to moderate MA use disorders.
- *Provigil (modafinil*)*: This medication has mild stimulant properties that can assist in reducing issues of with disruptive sleep patterns, increase energy, and enhance concentration.
- *Selective serotonin reuptake inhibitors**: Paxil (paroxetine) is a selective serotonin reuptake inhibitor that has been shown in some studies to relieve cravings; however, research on the efficiency is mixed.
- *Remeron (mirtazapine*)*: Remeron is an atypical antidepressant that has its primary mechanism of action on both serotonin and norepinephrine. There is evidence that its use can help to prevent relapse during the withdrawal process.[xxiii]

Urinalysis Screens*:* Stimulant-dependent clients in outpatient programs need structure that provides support for engaging in healthy behaviors. Researchers assert that urine testing is part of that structure. Drug testing should not be presented or used primarily as an investigative tool or to test the honesty of clients but rather as a means of support for initiating and maintaining sobriety. [xiv]

Predicting and Preventing Relapse:

It is important to engage MA users in abstinence-promoting resources and enhance continuing care post-treatment because the majority of relapses occur within 6-12 months following treatment. Research indicates that the highest rates of relapse occurs early in the post-treatment period; within six months. Researchers argue that this predominant early relapse emphasizes the need for continuing care and strategies for connecting MA users to abstinence-promoting resources immediately following SUD treatment.

While the risk of relapse decreased with increasing duration of continuing abstinence, some risk of relapse remained years after treatment discharge, indicating a need for continuing availability of resources to the long-time abstinent MA user.

Studies found certain factors that were predictive of shorter time to relapse following treatment. These risk factors could be identified at admission to allow for targeted intervention planning. Risk factors predictive of shorter time to relapse included parental drug use and ever having sold MA. However, the protective factors of longer treatment episodes, and continuing treatment and/or self-help can counteract these vulnerabilities. Participation in self-help and/or additional SUD treatment during the abstinence period had the strongest effect size on duration of abstinence.[xxiv]

Exercise may improve outcomes: Research has shown that exercise can have a significant effect on reducing depression and anxiety among individuals in treatment for MA use disorder.[xxv, xxvi] In addition, exercise has been shown to improve the MA use related brain changes known as striatal dopaminergic deficits that have been linked to poor treatment outcomes. [xxvii]

Sexual Issues: Stimulant-dependent clients can have tremendous concerns and anxieties about the compulsive sexual behaviors they engage in while using stimulants. Client fears should be addressed in treatment, such as the fear that sex without drugs will be boring or impossible. [xiv]

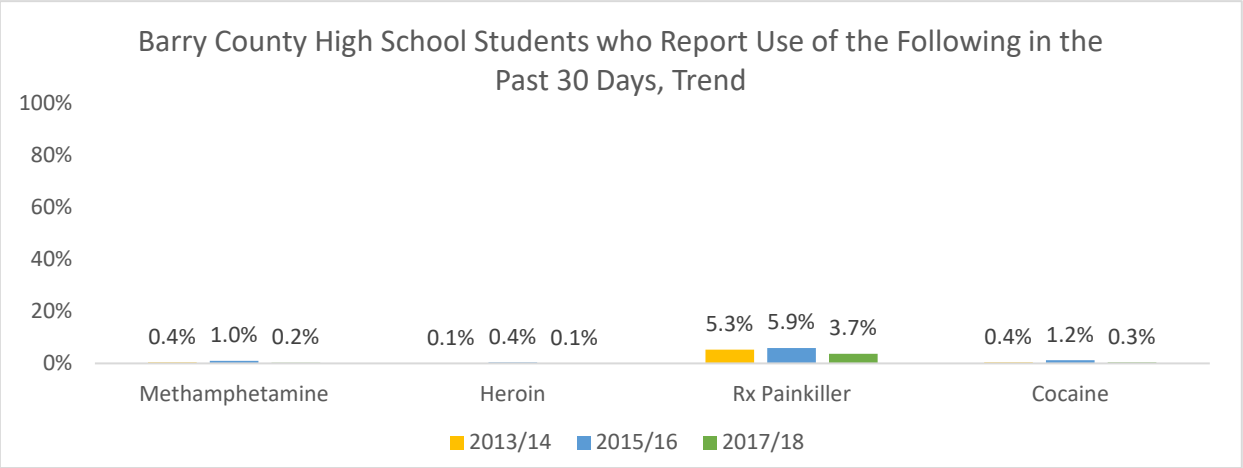
In addition, risky sexual behavior is common and harm reduction efforts should be incorporated such as condom promotion programs, safer sex education and safer sex negotiation for both male and female MA users, and HIV/AIDS testing can reduce these risks. [xxviii]

YOUTH USE AND RESOURCES

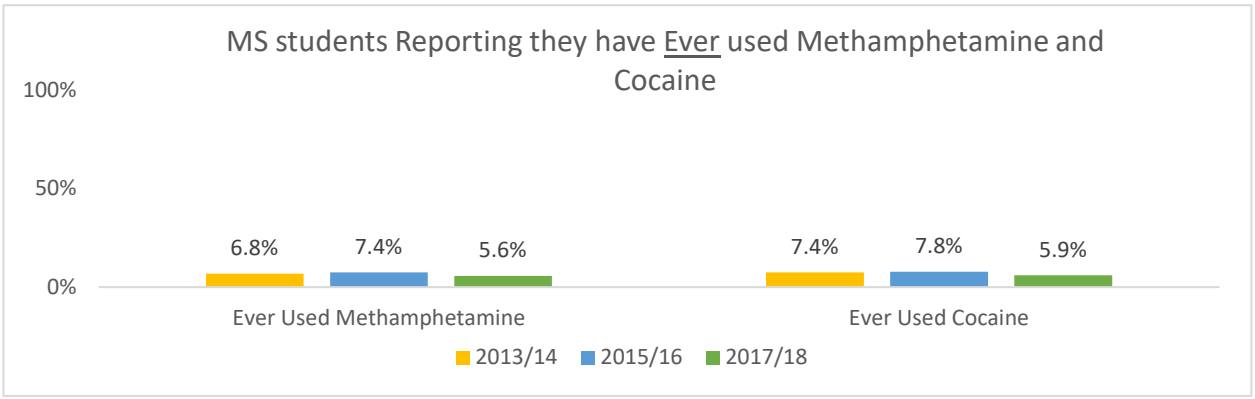
Youth Survey Data

The Michigan Profile for Healthy Youth (MIPHY) survey conducted by the Michigan Department of Education provides information on recent (past 30 days) methamphetamine (MA) and cocaine use for students in 9th and 11th grades.

Rates of youth use of stimulants and heroin have remained low with less than 1% of high school (HS) students reporting recent use of MA, heroin, or cocaine in 2018. Misuse of prescription painkillers was higher in 2018 with almost 4% of high school students reporting recent use of a prescription painkiller without a prescription.



Among middle school students in 2018, 5.6% reported they had ever used methamphetamine and 5.9% reported having ever used cocaine. These rates decreased slightly from previous years. In addition, 4.8% of MS students reported taking a prescription medication not prescribed to them in the past month, increasing slightly from previous years (3.5% in 2014, 3.8% in 2016).



Primary Prevention Messaging and Resources for Youth

The following section provides information about existing initiatives and resources to support methamphetamine (MA) specific prevention efforts. Resources were compiled in 2020 for the Lakeshore Regional Entity. Any additional resources that have become available since that time will not be included.

SAMHSA Tips for Teens: This flyer for teens provides facts about methamphetamine. It describes short and long-term effects and lists signs of methamphetamine use. The factsheet helps to dispel common myths about methamphetamine.

Available for download: https://store.samhsa.gov/product/Tips-for-Teens-The-Truth-About-Methamphetamine/PEP18-03

Montana Meth Project: Founded in 2005 by the Thomas and Stacey Siebel Foundation, in response to the growing Meth epidemic in the U.S. The Meth Project is a large-scale prevention program aimed at reducing Meth use through public service messaging, public policy, and community outreach. Central to the program is a research-based marketing campaign, community action programs, and an in-school lesson all designed to communicate the risks of meth use. Message campaign tagline is 'Not even once'.

Currently 6 states are implementing this project. Colorado has done extensive research and had positive results. The project has also been highlighted as effective by the White House, as well as the National Institute of Health which published a report in support of this project in 2010.[xxix]

The Montana Meth Project includes components designed to:

- Increase the perceived risk, and decrease the perceived benefit of trying meth, so that perceptions reflect accurate information about the drug.
- Increase Parent-Child and Peer Dialogue to reinforces the anti-meth message.
- Stigmatize use, making meth use socially unacceptable, just as cigarette smoking has become socially unacceptable in recent decades.
- Provide media literacy training for teens.
- Support youth to engage in difficult conversations and support their peers in avoiding drug use.
- Promoting the warning signs of MA use and how to get help for yourself or someone else.

The MethProject.org provides the following resources at no charge:

- Lesson for Teachers to implement: On-line interactive lesson for teachers that focuses on the risks of meth and how teens can prevent use among their peers. A

longer 3-lesson curricula is available with additional activities. A lesson plan outline and teacher's guide are available online.

- Marketing Campaign – Hard-hitting (borderline scare tactics) ads that direct to MethProject.org as the definitive source for information about MA for teens and young adults. Focus is to communicate the risks of MA use. Messaging is heavily focused on the impacts once addicted including physical changes and impact on loved ones.
- Documentaries and testimonials: Numerous video testimonials and documentaries are available that highlight the impact of methamphetamine. Of note, is the 'Brain & Behavior'" documentary on the effects of methamphetamine on the brain that explores the biological basis of addiction and the latest MA research.

REFERENCE

[i] NIDA. 2020, July 20. Overview. Retrieved from https://www.drugabuse.gov/publications/research-reports/methamphetamine/overview on 2020, December 31

[ii] Opioids | National Institute on Drug Abuse (NIDA), https://www.drugabuse.gov/drug-topics/opioids

[iii] Results From The 2017 National Survey On Drug Use And Health: Detailed Tables; from table "Past Year Initiation of Substance Use among Persons Aged 12 or Older: Numbers in Thousands…;" Substance Abuse and Mental Health Services Administration (SAMHSA); available at: https://www.samhsa.gov/data/sites/default/files/cbhsq-reports/NSDUHDetailedTabs2017/NSDUHDetailedTabs2017.htm#tab4-4B

[iv] Annual Report on Deaths Related to Opioids and Other Drugs, Barry County, Office of the Medical Examiner Annual 2020 Report, Western Michigan University School of Medicine, retrieved via https://mimedicalexaminer.com/sites/default/files/2021-05/Barry%20Annual%20DROOD%20Report%202020.pdf

[v] Data from the Michigan Death Certificate File, Division for Vital Records and Health Statistics, was provided upon request by the Michigan Department of Health and Human Services.

[vi] Michigan Substance Use Disorder Data Repository, Drug Overdose Deaths, Retrieved via https://mi-suddr.com.

[vii]National Emerging Threats Initiative, Emerging Threats Report 2018: Status and Factors Affecting the United States, Retrieved from https://www.hidtaprogram.org/pdf/2018_NETI_report.pdf, Sept.21, 2020.

[viii] Rawson R. A. (2013). Current research on the epidemiology, medical and psychiatric effects, and treatment of methamphetamine use. *Journal of food and drug analysis*, *21*(4), S77–S81. https://doi.org/10.1016/j.jfda.2013.09.039

[ix] NIDA. 2020, June 1. The Matrix Model (Stimulants). Retrieved from https://www.drugabuse.gov/publications/principles-drug-addiction-treatment-research-based-guide-third-edition/evidence-based-approaches-to-drug-addiction-treatment/behavioral-therapies/matrix on 2020, Dec. 28

[viii.] NIDA. 2020, June 1. The Matrix Model (Stimulants). Retrieved from https://www.drugabuse.gov/publications/principles-drug-addiction-treatment-research-based-guide-third-edition/evidence-based-approaches-to-drug-addiction-treatment/behavioral-therapies/matrix on 2020, December 28

[xi] NIDA. 2020, June 1. Contingency Management Interventions/Motivational Incentives (Alcohol, Stimulants, Opioids, Marijuana, Nicotine). Retrieved from https://www.drugabuse.gov/publications/principles-drug-addiction-treatment-research-based-guide-third-edition/evidence-based-approaches-to-drug-addiction-treatment/behavioral-therapies/contingency-management-interventions-motivational-incentives on 2020, December 28

[xii] Roll JM, Petry NM, Stitzer ML, Brecht ML, Peirce JM, McCann MJ, Blaine J, MacDonald M, DiMaria J, Lucero L, Kellogg S. Contingency management for the treatment of methamphetamine use disorders. Am J Psychiatry. 2006 Nov;163(11):1993-9. doi: 10.1176/ajp.2006.163.11.1993. PMID: 17074952.

[xiii] Petry NM, Peirce JM, Stitzer ML, Blaine J, Roll JM, Cohen A, Obert J, Killeen T, Saladin ME, Cowell M, Kirby KC, Sterling R, Royer-Malvestuto C, Hamilton J, Booth RE, Macdonald M, Liebert M, Rader L, Burns R, DiMaria J, Copersino M, Stabile PQ, Kolodner K, Li R. Effect of prize-based incentives on outcomes in stimulant abusers in outpatient psychosocial treatment programs: a national drug abuse treatment clinical trials network study. Arch Gen Psychiatry. 2005 Oct;62(10):1148-56. doi: 10.1001/archpsyc.62.10.1148. PMID: 16203960.

[xiv] TIP 33: Treatment for Stimulant Use Disorders, *Treatment Improvement Protocol (TIP) Series, No. 33, SAMHSA/*Center for Substance Abuse Treatment. https://www.ncbi.nlm.nih.gov/books/NBK64329/

[xv] Health Outcomes Associated with Methamphetamine Use Among Young People: A Systematic Review, Marshall, Brandon D. L., Webb, Daniel. Addiction, 2010 Jun; 105(6):991-1002. Doi: 10.1111/4.1360-0443.2010.02932.x., retrieved via https://pubmed.ncbi.nlm.nih.gov/20659059/

[xvi] Crystal Meth Withdrawal, retrieved from https://americanaddictioncenters.org/meth-treatment/withdrawal on December 10, 2020

[xvii] Zorick, T., Nestor, L., Miotto, K., Sugar, C., Hellemann, G., Scanlon, G., Rawson, R., & London, E. D. (2010). Withdrawal symptoms in abstinent methamphetamine-dependent subjects. *Addiction (Abingdon, England)*, *105*(10), 1809–1818. https://doi.org/10.1111/j.1360-0443.2010.03066.x

[xviii] *The nature, time course and severity of methamphetamine withdrawal, Research Report 2005, retrieved via http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.423.1576&rep=rep1&type=pdf*

[xix] One Program's Transition to Research-Based Strategies for Treating Methamphetamine Abuse, Hansen, Jay M., Addiction Science and Clinical Practice, 2007 April; 3(2): 29-34, retrieved via https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2851072/

[xx] Zorick, T., Nestor, L., Miotto, K., Sugar, C., Hellemann, G., Scanlon, G., Rawson, R., & London, E. D. (2010). Withdrawal symptoms in abstinent methamphetamine-dependent subjects. *Addiction (Abingdon, England)*, *105*(10), 1809–1818. https://doi.org/10.1111/j.1360-0443.2010.03066.x

[xxi] Crystal Meth Withdrawal, American Addiction Centers, 2019, retrieved via https://americanaddictioncenters.org/meth-treatment/withdrawal

[xxii] Information Bulletin, Center for Medicare and Medicaid Services Center for Medicaid and CHIP Services, July 11 2014, retrieved via https://www.medicaid.gov/federal-policy-guidance/downloads/cib-07-11-2014.pdf

[xxiii] Colfax GN, Santos GM, Das M, Santos DM, Matheson T, Gasper J, Shoptaw S, Vittinghoff E. Mirtazapine to reduce methamphetamine use: a randomized controlled trial. Arch Gen Psychiatry. 2011 Nov;68(11):1168-75. doi: 10.1001/archgenpsychiatry.2011.124. PMID: 22065532; PMCID: PMC3437988.

[xxiv] Time To Relapse Following Treatment For Methamphetamine Use: A Long-Term Perspective On Patterns And Predictors, NCBI, 2014, retrieved from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4550209/ on December 10, 2020

[xxv] Rawson RA, Chudzynski J, Gonzales R, Mooney L, Dickerson D, Ang A, Dolezal B, Cooper CB. The Impact of Exercise On Depression and Anxiety Symptoms Among Abstinent Methamphetamine-Dependent Individuals in A Residential Treatment Setting. J Subst Abuse Treat. 2015 Oct;57:36-40. doi: 10.1016/j.jsat.2015.04.007. Epub 2015 Apr 15. PMID: 25934458; PMCID: PMC4560957. Retrieved via https://pubmed.ncbi.nlm.nih.gov/25934458/

[xxvi] Finding a "Fix" for Meth Addiction – Can Exercise Help?, November 4 2019, Retrieved from Finding a "Fix" for Meth Addiction – Can Exercise Help? - Drug Rehab Options (rehabs.com) on December10, 2020

[xxvii] Effect of Exercise Training on Striatal Dopamine D2/D3 Receptors in Methamphetamine Users During Behavioral Treatment, Neuropsychopharmacology. 2016 May:41 (6)L1629-36. Retrieved via https://pubmed.ncbi.nlm.nih.gov/26503310/

[xxviii] Gere BO, Blessing A (2017) Harm Reduction Treatment Interventions for Rural Methamphetamine Abuse. J Drug Abuse. Vol. 3 No. 3:17 retrieved from https://drugabuse.imedpub.com/harm-reduction-treatment-interventions-for-rural-methamphetamine-abuse.php?aid=20535 on December 10, 2020

[xxix] Does Information Matter? The Effect of the Meth Project on Meth Use among Youths, National Institute of Health, 2010 Retrieved via https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4323270/ on January 5, 2021

[xxv] Polysubstance Use: A Dangerous Fourth Wave in the Opioid Crisis, HealthCity, Boston Medical Center Health System, June 13, 2019. Retrieved from https://www.bmc.org/healthcity/population-health/polysubstance-use-dangerous-fourth-wave-opioidcrisis#:~:text=Combining%20opioids%20with%20other%20drugs%20also%20increases%20the,may%20lower%20the%20effectiveness%20of%20the%20antidote%20naloxone on December 10, 2020.

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