HEALing Communities Study (HCS): Measure Technical Specifications

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HCS Data Capture Work Group

Version 3.0

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The National Institute on Drug Abuse (NIDA), part of the National Institutes of Health (NIH), and the Substance Abuse and Mental Health Services Administration (SAMHSA) launched the HEALing Communities Study (HCS) to investigate how tools for preventing and treating opioid misuse and opioid use disorder (OUD) are most effective at the local level. This multi-site implementation research study tested the impact of an integrated set of evidence-based practices across health care, behavioral health, justice, and other community-based settings. The goal of the study was to reduce opioid-related overdose deaths by 40 percent over the course of 3 years. Four Research Sites partnered with 67 communities highly affected by the opioid crisis in four states to measure the impact of these efforts. This research was supported by the National Institutes of Health, through the NIH Helping to End Addiction Long-term® (HEAL) Initiative under award numbers UM1DA049406 (Kentucky – University of Kentucky), UM1DA049417 (Ohio – The Ohio State University), UM1DA049412 (Massachusetts – Boston Medical Center), UM1DA049415 (New York – Columbia University), and UM1DA049394 (Data Coordinating Center -- RTI International).

HCS Measure Technical Specifications Version History

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(1) The Table of Contents does not include several HCS measures that were not developed due to data access/collection complexity (2.10 Number of individuals linked to MOUD following release from prison; 3.6 Number of EDs initiating and linking people to MOUD, and 3.7 Number of community-based opioid overdose prevention education programs), or implemented as de novo data collection/survey instruments and to be described in a separate specification document (2.11 Number of individuals provided MOUD while in jail, 3.5 Number of jails initiating and linking people to MOUD).

Data Sources for Measures

Measure	Data Source
P.1: County-defined community population denominator, all ages	U.S. Census Bureau's Single-Race Resident Population Estimates National Center for Health Statistics (NCHS) Bridged-Race Resident Population Estimates
P.1.1: County-defined community population estimates, 18+	U.S. Census Bureau's Single-Race Resident Population Estimates National Center for Health Statistics (NCHS) Bridged-Race Resident Population Estimates
P.2: Zip code–defined community population denominator, all ages	2014–2018 5-year American Community Survey (ACS)
P.2.1: Zip code–defined community population estimates, 18+	2014–2018 5-year American Community Survey (ACS)
M 1: Number of opioid overdose deaths (outcome measure for HCS Hypothesis H1)	Death certificates
M 1.1: Number of opioid overdose deaths involving heroin	Death certificates
M 1.2: Number of opioid overdose deaths involving synthetic opioids other than methadone (fentanyl)	Death certificates
M 1.3: Number of opioid overdose deaths involving any opioid and any psychostimulant (excluding cocaine)	Death certificates
M 1.4: Number of opioid overdose deaths involving any opioid and cocaine	Death certificates
M 1.5: Number of opioid overdose deaths involving any opioid and any psychostimulant (including cocaine)	Death certificates
M 1.6: Number of opioid overdose deaths involving any opioid and any benzodiazepine	Death certificates
M 2.1: Number of drug overdose deaths	Death certificates
M 2.1.1: Number of drug overdose deaths involving any psychostimulant (excluding cocaine)	Death certificates

Measure	Data Source
M 2.1.2: Number of drug overdose deaths involving cocaine	Death certificates
M 2.1.3: Number of drug overdose deaths involving any psychostimulant (including cocaine)	Death certificates
M 2.1.4: Number of drug overdose deaths involving any benzodiazepine	Death certificates
M 2.2: Number of nonfatal drug overdose hospitalizations and emergency department visits	Hospital inpatient and ED billing claims
M 2.2.1: Number of nonfatal drug overdose hospitalizations and emergency department visits involving any amphetamine	Hospital inpatient and ED billing claims
M 2.2.2: Number of nonfatal drug overdose hospitalizations and emergency department visits involving any form of cocaine	Hospital inpatient and ED billing claims
M 2.2.3: Number of nonfatal drug overdose hospitalizations and emergency department visits involving any psychostimulant (including cocaine)	Hospital inpatient and ED billing claims
M 2.2.4: Number of nonfatal drug overdose hospitalizations and emergency department visits involving any benzodiazepine	Hospital inpatient and ED billing claims
M 2.3: Number of nonfatal opioid overdose hospitalizations and emergency department visits	Hospital inpatient and ED billing claims
M 2.3.1: Number of nonfatal opioid overdose hospitalizations and emergency department visits involving heroin	Hospital inpatient and ED billing claims
M 2.3.2: Number of nonfatal opioid overdose hospitalizations and emergency department visits involving synthetic opioids other than methadone (fentanyl)	Hospital inpatient and ED billing claims
M 2.3.3: Number of nonfatal opioid overdose hospitalizations and emergency department visits involving any opioid and any amphetamine	Hospital inpatient and ED billing claims
M 2.3.4: Number of nonfatal opioid overdose hospitalizations and emergency department visits involving any opioid and any form of cocaine	Hospital inpatient and ED billing claims
M 2.3.5: Number of nonfatal opioid overdose hospitalizations and emergency department visits involving any opioid and any psychostimulant (including cocaine)	Hospital inpatient and ED billing claims
M 2.3.6: Number of nonfatal opioid overdose hospitalizations and emergency department visits involving any opioid and any benzodiazepine	Hospital inpatient and ED billing claims
M 2.4: Number of individuals with opioid dependence or abuse	Medicaid claims

Measure	Data Source
M 2.5.1: Number of individuals who received buprenorphine for treatment of OUD (outcome measure for HCS Hypothesis H3)	PDMP data
M 2.5.2: Number of individuals who received methadone for treatment of OUD	Medicaid claims
M 2.5.3: Number of individuals who received naltrexone (combined injectable and oral) for treatment of OUD	Medicaid claims
M 2.5.3.A: Number of individuals who received naltrexone (injectable only) for treatment of OUD	Medicaid claims
M 2.5.3.B: Number of individuals who received naltrexone (oral only) for treatment of OUD	Medicaid claims
M 2.5.4: Number of individuals with OUD who received medication for treatment of OUD	Medicaid claims
M 2.5.5: Number of individuals who received buprenorphine for treatment of OUD	Medicaid claims
M 2.6.1: Number of individuals with OUD who received behavioral health treatment in inpatient settings	Medicaid claims
M 2.6.2: Number of individuals with OUD who received behavioral health treatment in intensive outpatient settings	Medicaid claims
M 2.6.3: Number of individuals with OUD who received behavioral health treatment in outpatient settings	Medicaid claims
M 2.6.4: Number of individuals with OUD who received behavioral health treatment in any setting	Medicaid claims
M 2.6.5: Number of individuals with OUD who received case management	Medicaid claims
M 2.6.6: Number of individuals with OUD who received peer support	Medicaid claims
M 2.6.7: Number of individuals with OUD who received case management and/or peer support	Medicaid claims
M 2.7.1: Number of individuals who received buprenorphine for treatment of OUD that are retained at least 180 days	PDMP data
M 2.7.2: Number of individuals who received methadone for treatment of OUD that are retained at least 180 days	Medicaid claims
M 2.7.3: Number of individuals who received naltrexone (combined injectable and oral) for treatment of OUD that are retained at least 180 days	Medicaid claims

Measure	Data Source
M 2.7.3.A: Number of individuals who received naltrexone (injectable only) for treatment of OUD that are retained at least 180 days	Medicaid claims
M 2.7.3.B: Number of individuals who received naltrexone (oral only) for treatment of OUD that are retained at least 180 days	Medicaid claims
M 2.7.4: Number of individuals who received medication for treatment of OUD that are retained at least 180 days	Medicaid claims
M 2.7.5: Person-months of medication for OUD	Medicaid claims
M 2.7.6: Number of individuals who received buprenorphine for treatment of OUD that are retained at least 180 days (Medicaid)	Medicaid claims
M 2.8.1: Number of emergency medical services events involving naloxone administration	EMS runs data
M 2.8.2: Number of emergency medical services events with suspected opioid overdose	EMS runs data
M 2.9.1: Number of individuals linked to medication for OUD following an opioid overdose	Medicaid claims
M 2.9.2: Number of opioid overdoses in which the individual was connected to medication for OUD within 31 days	Medicaid claims
M 2.12.1: Number of individuals linked to medication for OUD following an opioid-related emergency department visit	Medicaid claims
M 2.12.2: Number of opioid-related emergency department visits with medication for OUD follow-up within 31 days	Medicaid claims
M 2.13: Number of individuals with a new high-risk opioid prescribing episode (outcome measure for HCS Hypothesis 4)	PDMP data
M 2.14.1: Number of naloxone units distributed through community-based programs	State health department data
M 2.14.2: Number of naloxone units dispensed by community pharmacies	IQVIA data
M 2.14.3: Number of naloxone units distributed in community - combined (outcome measure for HCS Hypothesis H2)	State health department data, IQVIA data
M 2.14.4: Number of naloxone units purchased with HCS funds	HEALing Communities Study (HCS) records for naloxone units purchased with HCS funds and distributed to community agencies/organizations

Measure	Data Source
M 2.15: Number of individuals with OUD who are screened, diagnosed, and treated for hepatitis C	Medicaid claims
M 2.16: Number of newly diagnosed HIV cases	State registry data
M 2.17: Number of opioid-related overdoses treated in the emergency department and captured by syndromic surveillance	Syndromic surveillance data
M 2.18: Number of new acute opioid prescriptions limited to a 7-day supply	PDMP data
M 2.19: Number of individuals screened for substance use (alcohol, drug use)	Medicaid claims
M 3.1: Number of individuals with opioid prescriptions from multiple prescribers or pharmacies	PDMP data
M 3.2: Number of providers with a DATA 2000 waiver	DEA data
M 3.2.30: Number of providers with a DATA 2000 waiver with 30-patient limit	DEA data
M 3.2.100: Number of providers with a DATA 2000 waiver with 100-patient limit	DEA data
M 3.2.275: Number of providers with a DATA 2000 waiver with 275-patient limit	DEA data
M 3.3: Number of providers with a DATA 2000 waiver who actively prescribe buprenorphine for treatment of OUD	PDMP data, DEA data
M 3.3.30: Number of providers with a DATA 2000 waiver with a 30-patient limit who actively prescribe buprenorphine for treatment of OUD	PDMP data, DEA data
M 3.3.100: Number of providers with a DATA 2000 waiver with a 100-patient limit who actively prescribe buprenorphine for treatment of OUD	PDMP data, DEA data
M 3.3.275: Number of providers with a DATA 2000 waiver with a 275-patient limit who actively prescribe buprenorphine for treatment of OUD	PDMP data, DEA data
M 3.4: Number of providers who actively prescribe buprenorphine for treatment of OUD	PDMP data
M 3.8: Number of drug take back drop boxes	DEA data
M 4.1.1: Number of emergency department visits for drug overdose or mental/behavioral disorders	Medicaid claims
M 4.1.2: Number of emergency department visits NOT related to drug overdose or mental/behavioral disorders	Medicaid claims

Measure	Data Source
M 4.2.1: Number of hospital inpatient nights for drug overdose or mental/behavioral disorders excluding detoxification	Medicaid claims
M 4.2.2: Number of hospital inpatient nights for detoxification	Medicaid claims
M 4.2.3: Number of hospital inpatient nights NOT for drug overdose or mental/behavioral disorders or detoxification	Medicaid claims
M 4.3.1: Number of nights at a residential treatment center NOT involving detoxification	Medicaid claims
M 4.3.2: Number of nights at a residential treatment center for detoxification	Medicaid claims
M 4.4.1: Number of intensive outpatient visits for behavioral health treatment	Medicaid claims
M 4.5.1: Number of outpatient visits for mental/behavioral disorders	Medicaid claims
M 4.5.2: Number of outpatient visits NOT related to mental/behavioral disorders	Medicaid claims
M 4.6.1: Number of medication days' supply of sublingual buprenorphine for treatment of OUD	Medicaid claims
M 4.6.2: Number of injections of buprenorphine for treatment of OUD	Medicaid claims
M 4.6.3: Number of medication days' supply of oral naltrexone for treatment of OUD	Medicaid claims
M 4.6.4: Number of injections of naltrexone for treatment of OUD	Medicaid claims
M 4.6.5: Number of medication days' supply of methadone for treatment of OUD	Medicaid claims
M 4.7.1: Number of medication days' supply of opioid pain prescriptions	Medicaid claims
M 4.7.2: Number of medication days' supply of non-opioid pain prescriptions	Medicaid claims

ACS = American Community Survey; ASAM = American Society of Addiction Medicine; DATA 2000 = Drug Addiction Treatment Act of 2000; DEA = U.S. Drug Enforcement Administration; detox = detoxification; FDA = U.S. Food and Drug Administration; H = Hypothesis; HCS = HEALing Communities Study; M = measure; NCHS = National Center for Health Statistics; OUD = opioid use disorder; PDMP = prescription drug monitoring program.

Acronyms

ACS	American Community Survey
ASAM	American Society of Addiction Medicine
BH	behavioral health
CC	chief complaint
CDC	Centers for Disease Control and Prevention
CPT	Current Procedural Terminology
CSA	Controlled Substances Act
CTH	Communities That HEAL
DATA 2000	Drug Addiction Treatment Act of 2000
DCWG	Data Capture Work Group of the HEALing Communities Study
DD	discharge diagnosis
DEA	U.S. Drug Enforcement Administration
DSM-5	*Diagnostic and Statistical Manual of Mental Disorders*, 5th edition
ED	emergency department
EMS	emergency medical services
ESSENCE	Electronic Surveillance System for the Early Notification of Community-based Epidemics
ESSS	Electronic Syndromic Surveillance System
FDA	U.S. Food and Drug Administration
FQHC	Federally Qualified Health Center
GPI	generic product identifier
HCPCS	Healthcare Common Procedure Coding System
HCS	HEALing Communities Study
HCV	hepatitis C virus
HEAL	Helping to End Addiction Long-term® Initiative
ICD-10	*International Classification of Diseases*, Tenth Revision
ICD-10-CM	*International Classification of Diseases*, Tenth Revision, Clinical Modification
ICD-10-PCS	*International Classification of Diseases*, Tenth Revision, Procedure Coding System
IM	intramuscular
M	Measure

MED-File	Medi-Span Electronic Drug File
MME	morphine milligram equivalent
MODRN	Medicaid Outcomes Distributed Research Network
MOUD	medication for opioid use disorder
NCHS	National Center for Health Statistics
NDC	National Drug Code
NEMSIS	National Emergency Medical Services Information System
NIDA	National Institute on Drug Abuse
NIH	National Institutes of Health
NR	narrative report
NSSP	National Syndromic Surveillance Program
OEND	overdose education and naloxone distribution
OP	oral prescription
ORI	opioid-related incident
OUD	opioid use disorder
PASRR	Preadmission Screening and Resident Review
PDMP	prescription drug monitoring program
PI	primary impression
POS	place of service
SAMHSA	Substance Abuse and Mental Health Services Administration

Introduction

In 2019, the National Institutes of Health (NIH), in partnership with the Substance Abuse and Mental Health Services Administration, launched the HEALing Communities Study (HCS) as part of the NIH Helping to End Addiction Long-term® (HEAL) Initiative. HCS was a cluster randomized, wait-list controlled trial designed to evaluate the impact of Communities That HEAL (CTH) intervention. The intervention consisted of an integrated set of evidence-based practices that aimed to prevent opioid overdose deaths and improve opioid use disorder (OUD) treatment with medications across health care, behavioral health, justice, and community settings. A total of 67 communities across four states (Kentucky, Massachusetts, New York, and Ohio) that were significantly affected by the opioid epidemic and met the study eligibility criteria participated in the HCS.

These 67 communities were randomized into two groups: Wave 1, receiving the CTH intervention from January 1, 2020 through June 30, 2022; and Wave 2—the waitlist control—receiving the CTH intervention from July 1, 2022 through December 31, 2023.

The HCS had one primary hypothesis (H1) and 3 secondary hypotheses (H2, H3, H4). It was hypothesized that during the **evaluation period (July 1, 2021–June 30, 2022)** the Wave 1 communities, compared to Wave 2 communities will have:

H1: Lower opioid overdose deaths
H2: Increased naloxone distribution
H3: Expanded utilization of medications for opioid use disorder (MOUD)
H4: Lower high-risk opioid prescribing

As communities and researchers participated in the intervention, it was important they understood the nature, severity, and trends of the opioid crisis at the local level. Prompt and precise access to data was key to guiding the participating communities to identify prevention and treatment resource gaps, develop data-driven action plans, and monitor the uptake and success of the evidence-based practices that make up the CTH intervention. These data were also used to assess the primary and secondary outcomes of the HCS study. Guided by a cascade of care framework for OUD, the HCS Data Capture Work Group (DCWG) used a structured consensus decision-making process to develop technical specifications to operationalize the study measures for the HCS.[†]

Measure 1 was the primary outcome (i.e., opioid overdose deaths). Measures in the 2.x series were secondary outcomes expected to impact opioid overdose deaths or were used to monitor other adverse health conditions related to opioid misuse or OUD. Outcomes that were part of the cascade of care included screening, OUD diagnosis, initiation of MOUD treatment, retention in MOUD, and linkage to MOUD. MOUD included the three medications approved by the U.S. Food and Drug Administration (FDA) for the treatment of OUD: buprenorphine, methadone, and naltrexone. Secondary outcomes that could be part of the pathway to reduce opioid overdose

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[†] Slavova S, LaRochelle MR, Root ED, et al. Operationalizing and selecting outcome measures for the HEALing Communities Study. *Drug Alcohol Depend*. 2020;217:108328. doi:10.1016/j.drugalcdep.2020.108328

fatalities were ambulance calls for opioid-related incidents, safer opioid prescribing practices, naloxone units distributed, and hospital visits for nonfatal overdose events. Other secondary measures monitored the incidence of hepatitis C and HIV. Measures in the 3.x series included structural outcomes that could impact secondary outcomes and ultimately opioid overdose rates. Structural measures included the number of drug take-back drop boxes, providers actively prescribing buprenorphine for OUD, and instances where individuals filled opioid prescriptions from multiple prescribers or multiple pharmacies. Finally, measures in the 4.x series were used to estimate incremental cost of health care services, cost effectiveness, and economic modeling for HCS. These outcomes were for visits to hospital, emergency department, or inpatient settings for OUD treatment, and MOUD treatment duration.

The technical specification for each measure consists of the title of the measure, the data source(s), and the methodology used to calculate the measure. The **study measures are defined as counts** and reported as such, though each study measure specification also includes a definition for an appropriate population definition for a denominator to calculate rates. All measures are aggregated at the community-level. The measurement periods for the measures are by month, quarter, calendar year, or the HCS evaluation period for the study, which was July 1, 2021 through June 30, 2022. For comparative purposes, Measures and Submeasures supporting the health economics studies (i.e., Measures 4.x) also report data for the same 12-month comparison years (i.e., July 1 through June 30) before and after the HCS evaluation period.

The following data sources are used to calculate the outcome measures:

- National Center for Health Statistics Bridged-Race Resident Population Estimates
- 5-year American Community Survey
- Death certificates
- State hospital inpatient billing claims and emergency department billing claims
- Administrative Medicaid claims
- Prescription drug monitoring programs
- Emergency medical services records
- State HIV registry
- State naloxone records
- IQVIA xPONENT® data
- U.S. Drug Enforcement Administration data
- Hospital-based syndromic surveillance

Measures of health care delivery for OUD largely relied on Medicaid as a data source because not all HCS states have all-payer claims databases. Medicaid claims capture services for which Medicaid provides reimbursement. For example, Measure 2.5.3 counts claims for naltrexone administered by state-certified mental health agencies to beneficiaries and are collected in administrative Medicaid claims data for reimbursement.

Population Measures

	P.1: County-defined community population estimates, all ages	P.2: Zip code–defined community population estimates, all ages
Measure Description	Total population in the county	Total population in the zip code
Background	National Center for Health Statistics (NCHS) collaborates with the U.S. Census Bureau to produce annual county-level population estimates for use as denominators to analyze health outcomes. These estimates use the 2010 decennial census to estimate U.S. county populations for postcensal years (i.e., the years after the decennial censuses). They are derived by updating the base population (the resident population enumerated in the decennial census) using various measures of population change reported by the NCHS, including births to U.S. resident women, deaths to U.S. residents, net international immigration, and migration within the United States.	The American Community Survey (ACS) is an ongoing survey based on a sample of the population that provides updated population estimates on a yearly basis. For small geographies such as zip codes, 5-year estimates are used to achieve a large sample size to accurately estimate the full population using the ACS sampling frame.
Data Sources	NCHS Bridged-Race Resident Population Estimates data	5-year ACS Population Estimates
Operational Definition	NCHS Bridged-Race Resident Population estimates ceased with the release of 2020 estimates in September 2021. Although there are plans to update intercensal (2010–2020) estimates in late 2023, sites using Bridged-Race estimates will utilize the September 2021 release from the NCHS and produced by the U.S. Census Bureau in collaboration with the NCHS.	Sites will use the most recent 5-year ACS population estimate available. For example, sites will use the 2015–2019 ACS estimates until the 2016–2020 estimates become available. The ACS estimates apply to all 5 years of the period from which data are drawn, and there are not separate annualized estimates.

Submeasures	P.1.1: County-defined community population estimates, 18+	P.2.1: Zip code–defined community population estimates, 18+
Stratifications	**Note: All stratifications apply to the Submeasures.** **Listed below is the cross-walk between county-defined (P.1) and zip-code-defined (P.2) community population stratifications.**	
	Sex	
	Male	Male
	Female	Female
	Missing	Missing
	Race/Ethnicity	
	Hispanic	Hispanic
	Non-Hispanic White	White Alone AND Not Hispanic or Latino
	Non-Hispanic Black/African American	Black/African American Alone AND Not Hispanic or Latino
	Non-Hispanic Other Race (includes American Indian, Alaska Native, Asian, Native Hawaiian, and Other Pacific Islander)	Other, including American Indian or Alaska Native Alone Asian Alone Native Hawaiian or Other Pacific Islander Alone Some Other Race Alone AND Not Hispanic or Latino
	Age	
	18-34	18-34
	35-54	35-54
	55+ years	55+ years

Submeasures	P.1.1: County-defined community population estimates, 18+	P.2.1: Zip code–defined community population estimates, 18+
Stratifications (continued)	**Community Attribution**	
	Kentucky: All communities **Massachusetts:** N/A **New York:** All communities except the communities named in P.2 **Ohio:** All communities	**Kentucky:** N/A **Massachusetts:** All communities **New York:** Buffalo (in Erie County), Rochester (in Monroe County), and Brookhaven Township (in Suffolk County) **Ohio:** N/A
	See Appendix A for full list and map of HCS communities	
Limitations	N/A	N/A
Resources	Centers for Disease Control and Prevention. (2021). *Bridged-race population estimates*. CDC WONDER. https://wonder.cdc.gov/bridged-race-population.html	U.S. Census Bureau. (2021). *American Community Survey data via FTP*. https://www.census.gov/programs-surveys/acs/data/data-via-ftp.html

Measures

1. Primary Outcome Measure and Submeasures

This section describes the technical specifications of the primary outcome measure on opioid overdose deaths and its submeasures.

M 1: Number of opioid overdose deaths (outcome measure for HCS Hypothesis 1)

Measure Description	Number of opioid overdose deaths (i.e., drug overdose deaths with opioid involvement, with or without co-involvement of other drugs) among individuals aged 18+ at the time of death.
Background	In 2017, the U.S. declared the opioid overdose epidemic a public health emergency. Approximately 80,000 Americans died as a result of an opioid overdose in 2023 alone. In response to this nationwide crisis, the primary HCS outcome measure is the number of opioid overdose deaths among residents in HCS communities.
Data Sources	Death certificate data **Kentucky:** Kentucky Cabinet for Health and Family Services, Office of Vital Statistics **Massachusetts:** Massachusetts Department of Public Health, Registry of Vital Records and Statistics **New York:** New York State Department of Health, Bureau of Vital Records and New York State Department of Health, Office of Science **Ohio:** Ohio Department of Health, Bureau of Vital Statistics
Measurement Periods	Month, quarter, calendar year, and HCS evaluation period (July 1, 2021–June 30, 2022)
Population	The population includes residents of HCS communities aged 18+. See Population Submeasure P.1.1 (18+) or P.2.1 (18+) for more details.
Operational Definition	1. Using the most recent death certificate file from the state office of vital statistics, identify the death certificate records with a date of death during the measurement period for individuals aged 18+ at time of death. 2. Further sub-select only death certificate records that list the resident's address as an address within an HCS community. 3. Next, sub-select only death certificate records with an underlying cause of death indicating drug overdose (i.e., an ICD-10 Underlying Cause of Death code in the following ranges: X40–X44, X60–X64, X85, and Y10–Y14). (For description of the ICD-10 codes, please see the World Health Organization's ICD-10 website at https://icd.who.int/browse10/2019/en) 4. Finally, sub-select only the drug overdose death certificate records with a multiple cause of death indicating opioid involvement (an ICD-10 code

	of T40.0–T40.4 or T40.6). For a description of ICD-10 codes, please see the World Health Organization's ICD-10 website at https://icd.who.int/browse10/2019/en
State-specific Specifications	**Kentucky:** Because of the historically large percentage of Kentucky drug overdose death certificate records that did not list any involved drugs and the continuous improvements in the last few years (e.g., from >20% in 2016, to <10% in 2019) (Hedegaard et al., 2020), two additional steps are included for cases from January 2018 until the end of the study period: (1) drug overdose deaths with no specific contributing drugs listed on the death certificate will be counted as opioid-involved if the postmortem toxicology is positive for opioid in blood source; and (2) drug overdose deaths with no specific contributing drugs listed on the death certificate and opioid positive toxicology only in urine are manually reviewed by the Chief Medical Examiner, using additional medicolegal death investigation records, to determine opioid involvement. The identified additional opioid overdose deaths will be added to the Kentucky cases identified based solely on the ICD-10-coded death certificate records in step 5. **Note:** This step is not required for other sites because they have a small and stable percentage of death certificates not listing any contributing drugs. **New York:** New York State consists of two registration areas: (1) New York City and (2) New York State Exclusive of New York City (also referred to as Rest of State). The Bureau of Vital Records, New York State Department of Health, processes death data recorded in New York State exclusive of New York City. Therefore, to provide HCS data in as near real-time as possible, death data submitted to HCS only include Rest of State records, in accordance with the cooperative agreement with the New York City Department of Health and Mental Hygiene. Following this process will ensure the creation of a quality harmonized measure that is captured consistently across the four research sites. A similar process will be followed to calculate the quarterly and/or monthly numbers of opioid overdose deaths.
Submeasures	**M 1.1: Number of opioid overdose deaths involving heroin** An opioid overdose death with an ICD-10 Multiple Cause of Death code of T40.1 is considered to be an opioid overdose death involving heroin. **M 1.2: Number of opioid overdose deaths involving synthetic opioids other than methadone (fentanyl)** An opioid overdose with an ICD-10 Multiple Cause of Death code of T40.4 is considered to be an opioid overdose death involving synthetic opioids other than methadone.

	M 1.3: Number of opioid overdose deaths involving any opioid and any psychostimulant (excluding cocaine) An opioid overdose with an ICD-10 Multiple Cause of Death code of T43.6 is considered to be an opioid overdose death involving a psychostimulant other than cocaine. **M 1.4: Number of opioid overdose deaths involving any opioid and cocaine** An opioid overdose with an ICD-10 Multiple Cause of Death code of T40.5 is considered to be an opioid overdose death involving cocaine. **M 1.5: Number of opioid overdose deaths involving any opioid and any psychostimulant (including cocaine)** An opioid overdose with an ICD-10 Multiple Cause of Death code of T40.5 or T43.6 is considered to be an opioid overdose death involving a psychostimulant. **M 1.6: Number of opioid overdose deaths involving any opioid and any benzodiazepine** An opioid overdose with an ICD-10 Multiple Cause of Death code of T42.4 is considered to be an opioid overdose death involving a benzodiazepine.
Stratifications	For calendar year and evaluation period only. **The stratifications do not apply to the Submeasures.** **Age:** 18–34, 35–54, 55+ years **Sex:** Male, female **Race/Ethnicity**: Non-Hispanic White, Non-Hispanic Black, Non-Hispanic Other Race, Hispanic Origin Any Race, missing
Resources	**Direct link to accompanying data tables with footnotes for drug involvement definitions:** https://www.cdc.gov/nchs/data/databriefs/db356_tables-508.pdf#2 Slavova, S., LaRochelle, M. R., Root, E. D., Feaster, D. J., Villani, J., Knott, C. E., Talbert, J., Mack, A., Crane, D., Bernson, D., Booth, A., & Walsh, S. L. (2020). Operationalizing and selecting outcome measures for the HEALing Communities Study. *Drug and Alcohol Dependence, 217*, 108328. https://doi.org/10.1016/j.drugalcdep.2020.108328 Hedegaard, H., Miniño, A. M., & Warner, M. (2020). *Drug overdose deaths in the United States, 1999–2018* (NCHS Data Brief No. 356). U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Health Statistics. https://www.cdc.gov/nchs/data/databriefs/db356-h.pdf National Center for Health Statistics. (2017). *ICD-10-Mortality Manual 2a – 2017: Instructions for classifying the underlying cause of death, 2017*. https://www.cdc.gov/nchs/data/dvs/2a_2017.pdf

	National Center for Health Statistics. (2017). *ICD-10-Mortality Manual 2b – 2017: Instructions for classifying multiple causes of death, 2017*. https://www.cdc.gov/nchs/data/dvs/2b_2017.pdf

2. Secondary Measures and Submeasures on Outcomes that Are Part of the Linked Pathway to Reducing Opioid Overdose Mortality

M 2.1: Number of drug overdose deaths

Measure Description	Number of drug overdose deaths among individuals aged 18+ at the time of death.
Background	While the primary outcome of the HCS is opioid overdose death, it is essential to monitor all drug overdose deaths among HCS community residents to understand whether the HCS intervention impacted drug overdose mortality overall. There were over 100,000 drug overdose deaths in the U.S. during 2023.
Data Sources	Death certificate data **Kentucky:** Kentucky Cabinet for Health and Family Services, Office of Vital Statistics **Massachusetts:** Massachusetts Department of Public Health, Registry of Vital Records and Statistics **New York:** New York State Department of Health, Bureau of Vital Records and New York State Department of Health, Office of Science **Ohio**: Ohio Department of Health, Bureau of Vital Statistics
Measurement Periods	Month, quarter, calendar year, and HCS evaluation period (July 1, 2021–June 30, 2022)
Population	This measure can be calculated as a rate using the following denominator: Population Submeasure P.1.1 (18+) or P.2.1 (18+). Please see the Population Measures section for details on calculation.
Operational Definition	1. Using the most recent death certificate file from the state office of vital statistics, identify the death certificate records with a date of death during the measurement period for individuals aged 18+ at time of death. 2. Further sub-select only death certificate records that list the decedent's resident address as an address within an HCS community. 3. Finally, sub-select only death certificate records with an underlying cause of death indicating drug overdose (i.e., an ICD-10 Underlying Cause of Death code in the following ranges: X40–X44, X60–X64, X85, and Y10–Y14). For a description of ICD-10 codes, please see the World Health Organization's ICD-10 website at https://icd.who.int/browse10/2019/en.
State-specific Specifications	**New York:** New York State consists of two registration areas: New York City and New York State Exclusive of New York City (also referred to as Rest of State). The Bureau of Vital Records, New York State Department of Health, processes death data recorded in New York State exclusive of New

	York City. Therefore, to provide HCS data in as near real-time as possible, death data submitted to HCS only include Rest of State records, in accordance with the cooperative agreement with the New York City Department of Health and Mental Hygiene. Following this process will ensure the creation of a quality harmonized measure that is captured consistently across the four research sites. A similar process will be followed to calculate the quarterly and/or monthly numbers of opioid overdose deaths.
Submeasures	From the dataset determined in the overall operational definition for M 2.1, calculate the following Submeasures: **M 2.1.1: Number of drug overdose deaths involving any psychostimulant (excluding cocaine)** A drug overdose with an ICD-10 Multiple Cause of Death code of T43.6 is considered to be a drug overdose death involving a psychostimulant other than cocaine. **M 2.1.2: Number of drug overdose deaths involving cocaine** A drug overdose with an ICD-10 Multiple Cause of Death code of T40.5 is considered to be a drug overdose death involving cocaine. **M 2.1.3: Number of drug overdose deaths involving any psychostimulant (including cocaine)** A drug overdose with an ICD-10 Multiple Cause of Death code of T40.5 or T43.6 is considered to be a drug overdose death involving a psychostimulant. **M 2.1.4: Number of drug overdose deaths involving any benzodiazepine** A drug overdose with an ICD-10 Multiple Cause of Death code of T42.4 is considered to be a drug overdose death involving a benzodiazepine.
Stratifications	For calendar year and evaluation period only. **The stratifications do not apply to the Submeasures.** **Age:** 18–34, 35–54, 55+ years **Sex:** Male, female **Race/Ethnicity:** Non-Hispanic White, Non-Hispanic Black, Non-Hispanic Other Race, Hispanic Origin Any Race, missing

M 2.2: Number of nonfatal drug overdose hospitalizations and emergency department visits

Measure Description	Number of nonfatal drug overdose hospitalizations and emergency department (ED) visits among individuals aged 18+.
Background	While the primary outcome of the HCS is opioid overdose death, nonfatal overdose is an important secondary outcome. In 2020, there were approximately ten nonfatal drug overdoses per every one fatal drug overdose in the U.S. (Casillas et al., 2024). Trends in acute care encounters for nonfatal overdose may diverge because of HCS interventions.
Data Sources	State hospital inpatient and ED administrative data claims **Kentucky:** Kentucky Cabinet for Health and Family Services, Office of Data Analytics **Massachusetts:** Massachusetts Department of Public Health, Center for Health Information and Analysis **New York:** New York State Department of Health, Office of Health Services Quality and Analytics and New York State Department of Health, Office of Science **Ohio:** Ohio Hospital Association
Measurement Periods	Month, quarter, calendar year, and HCS evaluation period (July 1, 2021–June 30, 2022) Submeasures are measured by calendar year and HCS evaluation period (July 1, 2021–June 30, 2022)
Population	This measure can be calculated as a rate using the following denominator: Population Submeasure P.1.1 (18+) or P.2.1 (18+). Please see the Population Measures section for details on calculation.
Operational Definition	Inpatient hospitalization or ED visit discharge records for HCS residents with discharge status other than death and at least one ICD-10-CM Diagnosis Code of drug overdose (detailed in step 4) in any Discharge Diagnosis field (i.e., Principal/First-Listed or Secondary Diagnosis fields). (For the full list of ICD-10-CM Diagnosis Codes and descriptions, please see https://icd10cmtool.cdc.gov/?fy=FY2021.) Note: The ICD-10-CM codes in administrative claim datasets are typically entered as character/string variables, without the "." after the 3rd character in the code (e.g., the code T40.1X1A (unintentional heroin overdose, initial encounter) would be entered in the claim record as "T401X1A"). The definitions below disregard the existence of the "." when referring to character position/number. 1. For ED billing claims data, exclude data on individuals who died and include only data on individuals who were residents of HCS communities within the state.

	2. For hospital inpatient billing claims data, exclude data on individuals who died and include only data on individuals who were residents of HCS communities within the state and include only data on acute care facilities. Note: hospital inpatient encounters originating in the same institution's ED are counted as hospital inpatient encounters only. 3. Join datasets from steps 1 and 2. 4. Of the joined datasets from step 3, include only records with any mention of ICD-10-CM Diagnosis Codes beginning with T36–T50 (drug overdose) AND a 5th/6th character of 1: Accidental (unintentional) 2: Intentional self-harm 3: Assault 4: Undetermined intent **Note:** For ICD-10-CM Diagnosis Codes beginning with T36.9, T37.9, T39.9, T41.4, T42.7, T43.9, T45.9, T47.9, or T49.9, a 5th character; for all others, a 6th character AND a 7th (last) character of A (initial encounter of care) OR missing 5. Calculate drug overdose counts at the HCS community level by measurement period (based on discharge date). **Rate:** Nonfatal drug overdose events can be presented per population of 100,000 residents. **Programming Note:** Drug Overdose (Full Regular Expression) ((T3[679]9|T414|T427|T4[3579]9)[1-4].|(?!(T3[679]9|T414|T427|T4[3579]9))(T3[6-9]|T4[0-9]|T50)..[1-4])(A|$|\b) **Note**: This measure does not require continuous enrollment during the measurement period.
State-specific Specifications	**Kentucky:** Counts exclude encounters of care with observation status. The counts represent encounters of care. A patient seen in an ED in one facility and then transported to be admitted inpatient in different facility will have two encounters, one ED and one inpatient encounter. A patient treated in ED and then admitted inpatient in the same facility will have only one inpatient encounter in the dataset.

	Massachusetts: Counts are exclusive of patients seen in hospitals with observation status, regardless of whether they were seen in the ED. **New York:** "Observational stays" are considered ED visits or inpatient stays (depending on whether a patient was seen in the ED or the visit resulted in an admission). **Ohio:** Includes observation visits that were seen in the ED, identified by a revenue code of 0450, 0451, 0452 or 0459 on the visit.
Submeasures	**M 2.2.1: Number of nonfatal drug overdose hospitalizations and emergency department visits involving any amphetamine** Include records with 1. any mention of an ICD-10-CM Diagnosis Code of T43.62 AND 2. a 6th character of 1: Accidental (unintentional) 2: Intentional self-harm 3: Assault 4: Undetermined intent AND 3. a 7th (last) character of A (initial encounter of care) OR missing **M 2.2.2: Number of nonfatal drug overdose hospitalizations and ED visits involving any form of cocaine** Include records with 1. any mention of an ICD-10-CM Diagnosis Code of T40.5* (where * is a wildcard indicating any character in the 5th digit) AND 2. a 6th character of 1: Accidental (unintentional) 2: Intentional self-harm 3: Assault 4: Undetermined intent AND 3. a 7th (last) character of

A (initial encounter of care)

OR

missing

M 2.2.3: Number of nonfatal drug overdose hospitalizations and emergency department visits involving any psychostimulant (including cocaine)

Include records with

1. any mention of ICD-10-CM Diagnosis Code of

   T40.5* (where * is a wildcard indicating any character in the 5th digit)

   T43.60–T43.64

   T43.69

   AND

2. a 6th character of

   1: Accidental (unintentional)

   2: Intentional self-harm

   3: Assault

   4: Undetermined intent

   AND

3. a 7th (last) character of

   A (initial encounter of care)

   OR

   missing

M 2.2.4: Number of nonfatal drug overdose hospitalizations and emergency department visits involving any benzodiazepine

Include records with

1. any mention of an ICD-10-CM Diagnosis Code of T42.4X

   AND

2. a 6th character of

   1: Accidental (unintentional)

   2: Intentional self-harm

   3: Assault

   4: Undetermined intent

   AND

3. a 7th (last) character of

	A (initial encounter of care) OR missing
Stratifications	For calendar year and evaluation period only. **The stratifications do not apply to the Submeasures.** **Age:** 18–34, 35–54, 55+ years, missing **Sex:** Male, female, missing **Race/Ethnicity:** Non-Hispanic White, Non-Hispanic Black, Non-Hispanic Other Race, Hispanic Origin Any Race, missing
Resources	Casillas SM, Pickens CM, Tanz LJ, Vivolo-Kantor AM. Estimating the ratio of fatal to non-fatal overdoses involving all drugs, all opioids, synthetic opioids, heroin or stimulants, USA, 2010-2020. Inj Prev. 2024;30(2):114-124. https://doi.org/10.1136/ip-2023-045091 Council of State and Territorial Epidemiologists. (2021). *Indicator-specific regular expressions*. https://resources.cste.org/ICD-10-CM/Standardized%20Validation%20Datasets/Indicator-Specific%20Regular%20Expressions_4-8-21.pdf Council of State and Territorial Epidemiologists. (2020). *Drug overdose indicator*. https://resources.cste.org/ICD-10-CM/Drug%20Overdose%20Indicator/Drug%20Overdose%20Indicator.pdf Council of State and Territorial Epidemiologists. (2020). *Programming resources and standardized validation datasets*. https://resources.cste.org/Injury-Surveillance-Methods-Toolkit/Home/ProgrammingResources Vivolo-Kantor, A., Pasalic, E., Liu, S., Martinez, P. D., Gladden, R. M., & the Overdose Morbidity Team. (2021). Defining indicators for drug overdose emergency department visits and hospitalisations in ICD-10-CM coded discharge data. *Injury Prevention, 27*(Suppl 1), i56–i61. https://doi.org/10.1136/injuryprev-2019-043521

M 2.3: Number of nonfatal opioid overdose hospitalizations and emergency department visits

Measure Description	Number of nonfatal opioid overdose hospitalizations and emergency department (ED) visits among individuals aged 18+.
Background	While the primary outcome of the HCS is opioid overdose deaths, nonfatal overdose is an important secondary outcome. In 2020, there were approximately four nonfatal opioid overdoses per every one fatal opioid overdose in the U.S. (Casillas et al., 2024). Nonfatal opioid overdoses may increase from increased use of naloxone and/or help-seeking behaviors,

	and engagement in MOUD may lead to decreased nonfatal opioid overdose events.
Data Sources	State hospital inpatient and ED administrative data claims **Kentucky:** Kentucky Cabinet for Health and Family Services, Office of Data Analytics **Massachusetts:** Massachusetts Department of Public Health, Center for Health Information and Analysis **New York:** New York State Department of Health, Office of Health Services Quality and Analytics and New York State Department of Health, Office of Science **Ohio:** Ohio Hospital Association
Measurement Periods	Month, quarter, calendar year, and HCS evaluation period (July 1, 2021–June 30, 2022) Submeasures are measured by calendar year and HCS evaluation period (July 1, 2021–June 30, 2022)
Population	This measure can be calculated as a rate using the following denominator: Population Submeasure P.1.1 (18+) or P.2.1 (18+). Please see the Population Measures section for details on calculation.
Operational Definition	Inpatient hospitalization or ED visit discharge records for HCS residents with discharge status other than death (expired) and at least one ICD-10-CM-- Diagnosis Code for opioid overdose (detailed in step 4) in any Discharge Diagnosis field (i.e., Principal/First-Listed or Secondary Diagnosis fields). (For ICD-10-CM Diagnosis Codes and descriptions, please see https://icd10cmtool.cdc.gov/?fy=FY2021.) 1. For ED billing claims data, exclude data on individuals who died. To avoid double counting encounters, exclude those where an individual was transferred to a different acute care hospital. Individuals admitted to the hospital from the same institution's ED are recorded only as inpatient admissions. Include only data on individuals who were residents of HCS communities within the state. 2. For hospital inpatient billing claims data, exclude data on individuals who died and include only data on individuals who were residents of HCS communities within the state and include only data on acute care facilities. 3. Join datasets from steps 1 and 2. 4. Of the joined datasets from step 3, include only records with any mention of ICD-10-CM Diagnosis Code of T40.0–T40.4 T40.6 AND a 6th character of

	1: Accidental (unintentional) 2: Intentional self-harm 3: Assault 4: Undetermined intent AND a 7th (last) character of A (initial encounter of care) OR missing 5. Calculate opioid overdose counts at the HCS community level by measurement period. **Rate:** Nonfatal opioid overdose events can be presented per population of 100,000 residents. **Programming Note:** Any Opioid Overdose (Full Regular Expression) ((T40[0-4].|T406[09])[1-4])(A|$|\b)
State-specific Specifications	**Kentucky:** Counts are exclusive of patients seen in hospitals with observation status, regardless of whether they were seen in the ED. **Massachusetts:** Counts are exclusive of patients seen in hospitals with observation status, regardless of whether they were seen in the ED. **New York:** "Observational stays" are considered ED visits or inpatient stays (depending on whether a patient was seen in the ED or the visit resulted in an admission). **Ohio:** Includes observation visits that were seen in the ED, identified by a revenue code of 0450, 0451, 0452 or 0459 on the visit.
Submeasures	**Among nonfatal opioid overdose events, identify Submeasures (M 2.3.1–M 2.3.6).** **M 2.3.1: Number of nonfatal opioid overdose hospitalizations and emergency department visits involving heroin** Include records with 1. any mention of ICD-10-CM Diagnosis Code of T40.1X, listed in any diagnostic field AND 2. a 6th character of 1: Accidental (unintentional) 2: Intentional self-harm 3: Assault 4: Undetermined intent

AND

3. a 7th (last) character of

   A (initial encounter of care)

   OR

   missing

M 2.3.2: Number of nonfatal opioid overdose hospitalizations and emergency department visits involving synthetic opioids other than methadone

Include records with

1. any mention of an ICD-10-CM Diagnosis Code of T40.4* (where * is a wildcard indicating any character in the 5th digit)

AND

2. a 6th character of

   1: Accidental (unintentional)

   2: Intentional self-harm

   3: Assault

   4: Undetermined intent

AND

3. a 7th (last) character of

   A (initial encounter of care)

   OR

   missing

M 2.3.3: Number of nonfatal opioid overdose hospitalizations and emergency department visits involving any opioid and any amphetamine

Include records with

1. any mention of an ICD-10-CM Diagnosis Code of T43.62

AND

2. a 6th character of

   1: Accidental (unintentional)

   2: Intentional self-harm

   3: Assault

   4: Undetermined intent

AND

3. a 7th (last) character of

   A (initial encounter of care)

   OR

   missing

M 2.3.4: Number of nonfatal opioid overdose hospitalizations and emergency department visits involving any opioid and any form of cocaine

Include records with

1. any mention of an ICD-10-CM Diagnosis Code of T40.5* (where * is a wildcard indicating any character in the 5th digit)

   AND

2. a 6th character of

   1: Accidental (unintentional)

   2: Intentional self-harm

   3: Assault

   4: Undetermined intent

   AND

3. a 7th (last) character of

   A (initial encounter of care)

   OR

   missing

M 2.3.5: Number of nonfatal opioid overdose hospitalizations and emergency department visits involving any opioid and any psychostimulant (including cocaine)

Include records with

1. any mention of ICD-10-CM Diagnosis Code of

   T40.5* (where * is a wildcard indicating any character in the 5th digit)

   T43.60–T43.64

   T43.69

   AND

2. a 6th character of

   1: Accidental (unintentional)

   2: Intentional self-harm

   3: Assault

   4: Undetermined intent

	AND 3. a 7th (last) character of A (initial encounter of care) OR missing **M 2.3.6: Number of nonfatal opioid overdose hospitalizations and emergency department visits involving any opioid and any benzodiazepine** Include records with 1. any mention of ICD-10-CM Diagnosis Code of T42.4X AND 2. a 6th character of 1: Accidental (unintentional) 2: Intentional self-harm 3: Assault 4: Undetermined intent AND 3. a 7th (last) character of A (initial encounter of care) OR missing
Stratifications	For calendar year and evaluation period only. **The stratifications do not apply to the Submeasures.** **Age:** 18–34, 35–54, 55+ years, missing **Sex:** Male, female, missing **Race/Ethnicity:** Non-Hispanic White, Non-Hispanic Black, Non-Hispanic Other Race, Hispanic Origin Any Race, missing
Resources	**Defining indicators for drug overdose ED visits and hospitalizations in ICD-10-CM–coded discharge data:** Vivolo-Kantor A, Pasalic E, Liu S, Martinez PD, Gladden RM; Overdose Morbidity Team. Defining indicators for drug overdose emergency department visits and hospitalizations in ICD-10-CM coded discharge data. Inj Prev. 2021 Mar;27(S1):i56-i61. doi: 10.1136/injuryprev-2019-043521. PMID: 33674334; PMCID: PMC7948191. Casillas SM, Pickens CM, Tanz LJ, Vivolo-Kantor AM. Estimating the ratio of fatal to non-fatal overdoses involving all drugs, all opioids, synthetic

	opioids, heroin or stimulants, USA, 2010-2020. Inj Prev. 2024;30(2):114-124. https://doi.org/10.1136/ip-2023-045091 Council of State and Territorial Epidemiologists. (2021). *Indicator-specific regular expressions*. https://resources.cste.org/ICD-10-CM/Standardized%20Validation%20Datasets/Indicator-Specific%20Regular%20Expressions_4-8-21.pdf Council of State and Territorial Epidemiologists. (2020). *Drug overdose indicator*. https://resources.cste.org/ICD-10-CM/Drug%20Overdose%20Indicator/Drug%20Overdose%20Indicator.pdf Council of State and Territorial Epidemiologists. (2020). *Programming resources and standardized validation datasets*. https://resources.cste.org/Injury-Surveillance-Methods-Toolkit/Home/ProgrammingResources

M 2.4: Number of individuals with opioid dependence or abuse (Medicaid)

Measure Description	Number of individuals enrolled in Medicaid aged 18-64 diagnosed with opioid dependence or abuse.
Background	This measure is a proxy for the number of individuals with opioid use disorder (OUD), which indicates the scope of the opioid problem in the community and can provide an estimate for the target population for OUD treatment. It counts the number of individuals who had at least one health care encounter with a diagnosis suggestive of OUD during the measurement period.
Data Sources	Administrative Medicaid claims data **Kentucky:** Kentucky Cabinet for Health and Family Services, Department for Medicaid Services **Massachusetts:** Massachusetts Executive Office of Health and Human Services **New York:** New York State Department of Health, Office of Health Insurance Programs **Ohio:** Ohio Department of Medicaid
Measurement Periods	Quarter, calendar year, and HCS evaluation period (July 1, 2021–June 30, 2022)
Population	Identify all Medicaid enrollees who were 18 to 64 years of age at any time during the measurement period (this does not include a 1-year lookback period) and who were not dual eligible (for Medicaid and Medicare) during the first month of the measurement period.
Operational Definition	Of Medicaid enrollees identified in the population, count unique individuals for whom an ICD-10-CM Diagnosis Code of F11.1X or F11.2X (“opioid abuse” or “opioid dependence”) was used in any setting (inpatient, outpatient, or professional claims), in any position at any time during the

	measurement period. ICD-10-CM Diagnosis Codes were used as proxy for OUD diagnoses. (For the full list of ICD-10-CM Diagnosis Codes and descriptions, please see https://icd10cmtool.cdc.gov/?fy=FY2021.) **Community Attribution:** Use the most recent residence on record to determine the HCS community. **Note:** This measure does not require continuous enrollment during the measurement period.
Stratifications	For calendar year and evaluation period only. **Age:** 18–34, 35–54, 55–64 years, as of last day of measurement period **Sex:** Male, female **Race/Ethnicity:** Hispanic, Non-Hispanic White, Non-Hispanic Black, Non-Hispanic Other, missing
Limitations	This measure is limited to individuals who were enrolled in Medicaid (i.e., the operational definition is limited to individuals who had a medical encounter with an ICD-10-CM code suggestive of OUD for which Medicaid was the primary payer). Individuals without an encounter using one of the specified ICD-10-CM codes suggestive of OUD will be missed, and for states without an all-payer claims database, OUD-related ICD-10-CM codes used on encounters for which Medicaid was not the primary payer will be missed. Because this measure assigns enrollees to HCS community based on residence, individuals who are diagnosed with an OUD in the HCS county but who reside elsewhere will not be included in the analysis. Unfortunately, ICD-10-CM Diagnosis Codes do not map to the *Diagnostic and Statistical Manual of Mental Disorders*, 5th edition (DSM-5) diagnosis of OUD. As a proxy, HCS used codes for "opioid abuse" or "opioid dependence." Although validation studies show modest diagnostic performance of these codes, the DCWG did not expect the codes' use to change during the HCS or between the Wave 1 and Wave 2 communities.

M 2.5.1: Number of individuals who received buprenorphine for treatment of OUD (outcome measure for HCS Hypothesis 3)

Measure Description	Number of individuals aged 18+ who received buprenorphine products that are FDA approved for the treatment of OUD.
Background	It is estimated that only 22% of adults in the U.S. with OUD received MOUD in 2021 (Jones et al, 2023). Receipt of treatment among individuals with OUD is used as a quality indicator of health care delivery systems (e.g., Healthcare Effectiveness Data and Information Set). MOUD is a component of best-practice treatment for OUD and may include buprenorphine. All prescriptions of buprenorphine are tracked by prescription drug monitoring programs (PDMPs) in every state. Given the timeliness of the PDMP data and the fact that buprenorphine is a scalable part of the HCS

	intervention, this measure was selected for testing the secondary hypothesis on expanding the utilization of MOUD.
Data Sources	PDMP data **Kentucky:** Kentucky Cabinet for Health and Family Services, Office of Inspector General, Division of Audits and Investigations **Massachusetts:** Massachusetts Department of Public Health, Office of Prescription Monitoring and Drug Control **New York:** New York State Department of Health, Bureau of Narcotic Enforcement and New York State Department of Health, Office of Science **Ohio:** Ohio Board of Pharmacy
Measurement Periods	Month, quarter, calendar year, and HCS evaluation period (July 1, 2021–June 30, 2022)
Population	This measure can be calculated as a rate using the following denominator: Population Submeasure P.1.1 (18+) or P.2.1 (18+). Please see the Population Measures section for details on calculation.
Operational Definition	***Appendix B*** contains detailed specifications for developing a PDMP analytic data set. 1. From the table created in step M in ***Appendix B***, select all records where the patient is ≥18 years of age on the day of the prescription fill. 2. From the table created in step 1, select the unique combinations of patient ID, year, quarter, and month of the prescription fills. 3. Join the table created in step 2 with the table created in step J of ***Appendix B*** on patient ID, year, and month. 4. Join the table created in step 2 with the table created in step K of ***Appendix B*** on patient ID, year, and quarter. 5. Join the table created in step 2 with the table created in step L of ***Appendix B*** on patient ID and year, creating separate counts for both calendar (January–December) and comparison (July–June) years. 6. Create monthly counts of unique patients by community from the table created in step 3, quarterly counts of unique patients by community from the table created in step 4, and yearly counts of unique patients by community from the table created in step 5. **Community Attribution:** Identify HCS communities by location of residence. Use the most recent residence record from the population definition. **Note:** This measure captures dispensed prescriptions with NDC numbers for buprenorphine products that are approved by the FDA for the treatment of OUD. (For a description of how NDCs were included in the measures, please see ***Appendix C***.) The NDC list is updated quarterly by the HCS team using the Medi-Span Electronic Drug File (MED-File) v2 for active and inactive products (Wolters Kluwer, 2020). Buprenorphine products directly purchased for administration in practitioner offices (i.e., products that are not first dispensed by pharmacies) are not captured in PDMP data.

	Transdermal, parenteral, and buccal formulations of buprenorphine approved for treatment of pain are excluded.
Stratifications	For calendar year and evaluation period only. **Age:** 18–34, 35–54, 55+ years Create stratified annual counts using the age of each patient. Calculate this with the date of birth selected in Step E and the end date of each annual period (calendar year or evaluation period). An individual should not be counted in more than one age stratum in the same annual period. **Sex:** Male, female, missing Use the sex that appears on each patient's final record of the annual period (calendar year or evaluation period). An individual should not be counted in more than one sex stratum in the same annual period.
Limitations	Buprenorphine products directly purchased for administration in practitioner offices (i.e., products that are not first dispensed by pharmacies) are not captured in PDMP data.
Resources	Jones CM, Han B, Baldwin GT, Einstein EB, Compton WM. Use of Medication for Opioid Use Disorder Among Adults With Past-Year Opioid Use Disorder in the US, 2021. JAMA Netw Open. 2023 Aug 1;6(8):e2327488. https://doi.org/10.1001/jamanetworkopen.2023.27488 Wolters Kluwer. (2020). Medi-Span Electronic Drug File (MED-File) v2.

M 2.5.2: Number of individuals who received methadone for treatment of OUD (Medicaid)

Measure Description	Number of individuals enrolled in Medicaid aged 18-64 diagnosed with OUD within 12 months of the measurement period who received methadone for treatment of OUD.
Background	It is estimated that only 22% of adults in the U.S. with OUD received MOUD in 2021 (Jones et al, 2023). Receipt of treatment among individuals with OUD is used as a quality indicator of health care delivery systems (e.g., Healthcare Effectiveness Data and Information Set). MOUD is a component of best-practice treatment for OUD and may include methadone.
Data Sources	Administrative Medicaid claims data **Kentucky:** Kentucky Cabinet for Health and Family Services, Department for Medicaid Services **Massachusetts:** Massachusetts Executive Office of Health and Human Services **New York:** New York State Department of Health, Office of Health Insurance Programs **Ohio:** Ohio Department of Medicaid

Measurement Periods	Quarter, calendar year, and HCS evaluation period (July 1, 2021–June 30, 2022)
Population	Medicaid enrollees, aged 18-64 years, who were diagnosed with OUD within 12 months of the measurement period.
Operational Definition	1. Identify individuals likely in need for OUD treatment (i.e., recent, within 12 months of the measurement period, diagnosis for OUD): Identify all Medicaid enrollees who were 18 to 64 years of age at any point during the measurement period and who were not dual eligible (for Medicaid and Medicare) during the first month of the measurement period. Limit to individuals residing in HCS communities. Identify (count) unique individuals with at least one encounter coded with an ICD-10-CM code suggestive of OUD (ICD-10-CM Diagnosis Code of F11.1X or F11.2X) in any setting (inpatient, outpatient, or professional claims), during the measurement period or the preceding 12 months. (For the full list of ICD-10-CM Diagnosis Codes and descriptions, please see https://icd10cmtool.cdc.gov/?fy=FY2021.) **Note**: The number of individuals with recent diagnosis of OUD identified in Step 1 can be used as a population definition for rate calculations. Note that this population is not the same as the operational definition of M 2.4 due to the longer lookback period. 2. Among the individuals with OUD identified in step 1, count unique individuals who had at least one Healthcare Common Procedure Coding System (HCPCS) code for methadone treatment for OUD during the measurement period: Use the list of HCPCS codes to identify office-based methadone administration. States should use HCPCS codes and criteria that best reflect state policy and coding. All states use HCPCS code H0020 for methadone administration. For site-specific information on methadone HCPCS codes, see ***Appendix D.*** **Community Attribution:** Use the most recent residence record from the population (measurement period plus the 12 months preceding the measurement period) to determine HCS community. **Note:** This measure does not require continuous enrollment during the measurement period.
Stratifications	For calendar year and evaluation period only. **Age:** 18–34, 35–54, 55–64 years, calculated as of last day of measurement period **Sex:** Male, female **Race/Ethnicity:** Hispanic, Non-Hispanic White, Non-Hispanic Black, Non-Hispanic Other, missing

Limitations	This measure will not capture in the eligible population the Medicaid beneficiaries with an undiagnosed OUD, or last OUD diagnosis older than 12 months prior the measurement period. The measure will not include those with encounters using OUD-related ICD-10-CM codes for which Medicaid was not the primary payer. Additionally, it will not capture methadone treatment claims for which Medicaid was not the primary payer. Kentucky's Medicaid program expanded coverage to include methadone for OUD treatment starting in July 2019.
Resources	Jones CM, Han B, Baldwin GT, Einstein EB, Compton WM. Use of Medication for Opioid Use Disorder Among Adults With Past-Year Opioid Use Disorder in the US, 2021. JAMA Netw Open. 2023 Aug 1;6(8):e2327488. https://doi.org/10.1001/jamanetworkopen.2023.27488

M 2.5.3: Number of individuals who received naltrexone (combined injectable and oral) for treatment of OUD (Medicaid)

Measure Description	Number of individuals enrolled in Medicaid aged 18-64 diagnosed with OUD within 12 months of the measurement period who received naltrexone for treatment of OUD.
Background	It is estimated that only 22% of adults in the U.S. with OUD received MOUD in 2021 (Jones et al, 2023). Receipt of treatment among individuals with OUD is used as a quality indicator of health care delivery systems (e.g., Healthcare Effectiveness Data and Information Set). MOUD is a component of best-practice treatment for OUD and may include naltrexone.
Data Sources	Administrative Medicaid claims data **Kentucky:** Kentucky Cabinet for Health and Family Services, Department for Medicaid Services **Massachusetts:** Massachusetts Executive Office of Health and Human Services **New York:** New York State Department of Health, Office of Health Insurance Programs **Ohio:** Ohio Department of Medicaid
Measurement Periods	Quarter, calendar year, and HCS evaluation period (July 1, 2021–June 30, 2022)
Population	1. Identify all Medicaid enrollees who were 18 to 64 years of age at any point during the measurement period and who were not dual eligible (for Medicaid and Medicare) during the first month of the measurement period. 2. Limit to individuals residing in HCS communities. 3. Count unique individuals with at least one encounter that uses an ICD-10-CM code suggestive of an OUD diagnosis (ICD-10-CM Diagnosis

	Code of F11.1X or F11.2X) in any setting (inpatient, outpatient, or professional claims) in any position during the measurement period or the 12 months 365 days) preceding the measurement period. (For the full list of ICD-10-CM Diagnosis Codes and descriptions, please see https://icd10cmtool.cdc.gov/?fy=FY2021.) This is the population definition. Note that this population is not the same as the operational definition of M 2.4 due to the longer lookback period.
Operational Definition	1. Of those in the population, count unique individuals who had at least one claim for naltrexone at any point during the measurement period. This is the operational definition. Naltrexone may be identified using National Drug Code (NDC) from pharmacy claims or using Healthcare Common Procedure Coding System (HCPCS) codes. 1a. Use NDC numbers for naltrexone. (For a description of how NDCs were included in the measures, please see ***Appendix C***.) 1b. Use HCPCS codes for naltrexone. HCPCS codes may vary by state. States should use HCPCS codes and criteria that best reflect state policy and coding. For site-specific information on naltrexone HCPCS codes, see ***Appendix D.*** For a visual representation of the operational definition, population, and lookback period, please see ***Appendix E***. **Note:** This measure does not require continuous enrollment during the measurement period. **Community Attribution:** Use the most recent residence record from the population definition (12 months prior to measurement period, plus measurement period) to determine HCS community.
Stratifications	For calendar year and evaluation period only. **Age:** 18–34, 35–54, 55–64 years, calculated as of last day of measurement period **Sex:** Male, female **Race/Ethnicity:** Hispanic, Non-Hispanic White, Non-Hispanic Black, Non-Hispanic Other, missing
Limitations	This measure will capture only claims for which naltrexone prescription or administration is recorded in in Medicaid claims data. Therefore, it will not capture naltrexone for which Medicaid was not the primary payer.
Resources	Jones CM, Han B, Baldwin GT, Einstein EB, Compton WM. Use of Medication for Opioid Use Disorder Among Adults With Past-Year Opioid Use Disorder in the US, 2021. JAMA Netw Open. 2023 Aug 1;6(8):e2327488. https://doi.org/10.1001/jamanetworkopen.2023.27488 Wolters Kluwer. (2020). Medi-Span Electronic Drug File (MED-File) v2.

M 2.5.3.A: Number of individuals who received naltrexone (injectable only) for treatment of OUD (Medicaid)

Measure Description	Number of individuals enrolled in Medicaid aged 18-64 diagnosed with OUD within 12 months of the measurement period who received intramuscular (IM) injectable naltrexone for treatment of OUD.
Background	It is estimated that only 22% of adults in the U.S. with OUD received MOUD in 2021 (Jones et al, 2023). Receipt of treatment among individuals with OUD is used as a quality indicator of health care delivery systems (e.g., Healthcare Effectiveness Data and Information Set). MOUD is a component of best-practice treatment for OUD and may include naltrexone.
Data Sources	Administrative Medicaid claims data **Kentucky:** Kentucky Cabinet for Health and Family Services, Department for Medicaid Services **Massachusetts:** Massachusetts Executive Office of Health and Human Services **New York:** New York State Department of Health, Office of Health Insurance Programs **Ohio:** Ohio Department of Medicaid
Measurement Periods	Quarter, calendar year, and HCS evaluation period (July 1, 2021–June 30, 2022)
Population	1. Identify all Medicaid enrollees who were 18 to 64 years of age at any point during the measurement period and who were not dual eligible (for Medicaid and Medicare) during the first month of the measurement period. 2. Limit to individuals residing in HCS communities. 3. Count unique individuals with at least one encounter that uses an ICD-10-CM code suggestive of an OUD diagnosis (ICD-10-CM Diagnosis Code of F11.1X or F11.2X) in any setting (inpatient, outpatient, or professional claims), in any position during the measurement period or the 12 months preceding the measurement period. (For the full list of ICD-10-CM Diagnosis Codes and descriptions, please see https://icd10cmtool.cdc.gov/?fy=FY2021.) This is the population definition. Note that this population is not the same as the operational definition of M 2.4 due to the longer lookback period.
Operational Definition	1. Of those in the population, count unique individuals with a claim for IM naltrexone at any point during the measurement period. This is the operational definition. 1a. Use National Drug Code (NDC) numbers for intramuscular (IM) naltrexone. (For a description of how NDCs were included in the measures, please see ***Appendix C***.) 1b. Use HCPCS codes for IM naltrexone. HCPCS codes may vary by state. States should use HCPCS codes and criteria that best reflect state

	policy and coding. For site-specific information on naltrexone HCPCS codes, see ***Appendix D.*** For a visual representation of the operational definition, population, and lookback period, please see ***Appendix E***. **Note:** This measure does not require continuous enrollment during the measurement period. **Community Attribution:** Identify HCS communities by location of residence. Use the most recent residence record from the population (12 months prior to measurement period, plus measurement period) to determine HCS community.
Stratifications	**Age:** 18–34, 35–54, 55–64 years, calculated as of last day of measurement period **Sex:** Male, female **Race/Ethnicity:** Hispanic, Non-Hispanic White, Non-Hispanic Black, Non-Hispanic Other, missing
Limitations	This measure will capture only claims for which administration is recorded in source data. Therefore, states who can only draw from administrative Medicaid claims data or state mental health data will miss naltrexone administration for which contributing source data entities were not the primary payer.
Resources	Jones CM, Han B, Baldwin GT, Einstein EB, Compton WM. Use of Medication for Opioid Use Disorder Among Adults With Past-Year Opioid Use Disorder in the US, 2021. JAMA Netw Open. 2023 Aug 1;6(8):e2327488. https://doi.org/10.1001/jamanetworkopen.2023.27488 Wolters Kluwer. (2020). Medi-Span Electronic Drug File (MED-File) v2.

M 2.5.3.B: Number of individuals who received naltrexone (oral only) for treatment of OUD (Medicaid)

Measure Description	Number of individuals enrolled in Medicaid aged 18-64 diagnosed with OUD within 12 months of the measurement period who received prescription oral naltrexone for treatment of OUD.
Background	It is estimated that only 22% of adults in the U.S. with OUD received MOUD in 2021 (Jones et al, 2023). Receipt of treatment among individuals with OUD is used as a quality indicator of health care delivery systems (e.g., Healthcare Effectiveness Data and Information Set). MOUD is a component of best-practice treatment for OUD and may include naltrexone.
Data Sources	Administrative Medicaid claims data **Kentucky:** Kentucky Cabinet for Health and Family Services, Department for Medicaid Services

	Massachusetts: Massachusetts Executive Office of Health and Human Services **New York:** New York State Department of Health, Office of Health Insurance Programs **Ohio:** Ohio Department of Medicaid
Measurement Periods	Quarter, calendar year, and HCS evaluation period (July 1, 2021–June 30, 2022)
Population	1. Identify all Medicaid enrollees who were 18 to 64 years of age at any point during the measurement period and who were not dual eligible (for Medicaid and Medicare) during the first month of the measurement period. 2. Limit to individuals residing in HCS communities. 3. Count unique individuals with at least one encounter that uses an ICD-10-CM code suggestive of an OUD diagnosis (ICD-10-CM Diagnosis Code of F11.1X or F11.2X) in any setting (inpatient, outpatient, or professional claims), in any position during the measurement period or the 12 months preceding the measurement period. (For the full list of ICD-10-CM- Diagnosis Codes and descriptions, please see https://icd10cmtool.cdc.gov/?fy=FY2021.) This is the population definition. Note that this population is not the same as the operational definition of M 2.4 due to the longer lookback period. **Community Attribution:** Identify HCS communities by location of residence. Use the most recent residence record from the population (12 months prior to measurement period, plus measurement period) to determine HCS community.
Operational Definition	1. Of those in the population, count unique individuals who had a claim for oral prescription (OP) naltrexone at any point during the measurement period. This is the operational definition. 2. Use National Drug Code (NDC) number for OP naltrexone. (For a description of how NDCs were included in the measures, please see ***Appendix C***.) For a visual representation of the operational definition, population, and lookback period, please see ***Appendix E***. **Note:** This measure does not require continuous enrollment during the measurement period.
Stratifications	**Age:** 18–34, 35–54, 55–64 years, calculated as of last day of measurement period **Sex:** Male, female **Race/Ethnicity:** Hispanic, Non-Hispanic White, Non-Hispanic Black, Non-Hispanic Other, missing
Limitations	This measure will capture only claims for which administration is recorded in source data. Therefore, states who can only draw from administrative

	Medicaid claims data will miss naltrexone administration for which contributing source data entities were not the primary payer.
Resources	Jones CM, Han B, Baldwin GT, Einstein EB, Compton WM. Use of Medication for Opioid Use Disorder Among Adults With Past-Year Opioid Use Disorder in the US, 2021. JAMA Netw Open. 2023 Aug 1;6(8):e2327488. https://doi.org/10.1001/jamanetworkopen.2023.27488 Wolters Kluwer. (2020). Medi-Span Electronic Drug File (MED-File) v2.

M 2.5.4: Number of individuals who received medication for the treatment of OUD (Medicaid)

Measure Description	Number of individuals enrolled in Medicaid aged 18-64 diagnosed with OUD within 12 months of the measurement period who received medication for opioid use disorder (MOUD) for treatment of OUD.
Background	It is estimated that only 22% of adults in the U.S. with OUD received MOUD in 2021 (Jones et al, 2023). Receipt of treatment among individuals with OUD is used as a quality indicator of health care delivery systems (e.g., Healthcare Effectiveness Data and Information Set). MOUD is a component of best-practice treatment for OUD and may consist of varying modalities (e.g., long-acting injection, prescription, in-office oral administration).
Data Sources	Administrative Medicaid claims data **Kentucky:** Kentucky Cabinet for Health and Family Services, Department for Medicaid Services **Massachusetts:** Massachusetts Executive Office of Health and Human Services **New York:** New York State Department of Health, Office of Health Insurance Programs **Ohio:** Ohio Department of Medicaid
Measurement Periods	Month, quarter, calendar year, and HCS evaluation period (July 1, 2021–June 30, 2022)
Population	1. Identify all Medicaid enrollees who were 18 to 64 years of age at any point during the measurement period and who were not dual eligible (for Medicaid and Medicare) during the first month of the measurement period. There is no requirement for continuous enrollment. 2. Limit to individuals residing in HCS communities. 3. Count unique individuals with an OUD diagnosis (ICD-10-CM Diagnosis Code of F11.1X or F11.2X) in any setting (inpatient, outpatient, or professional claims), in any position (primary or other diagnosis) in the 12 months prior to the measurement period or during the measurement period. (For the full list of ICD-10-CM Diagnosis Codes and descriptions, please see https://icd10cmtool.cdc.gov/?fy=FY2021.) This

	is the population definition. Note that this population is not the same as the operational definition of M 2.4 due to the longer lookback period.
Operational Definition	1. Of individuals in the population, count unique individuals who had at least one claim with a National Drug Code (NDC) number or a Healthcare Common Procedure Coding System (HCPCS) code for any of the following MOUDs during the measurement period: buprenorphine, naltrexone (intramuscular [IM] injectable or prescription oral), buprenorphine/naloxone, or methadone. (For a description of how NDCs were included in the measures, please see ***Appendix C.***) This is the operational definition. Use NDC numbers for MOUD. Use HCPCS Codes for office-based MOUD. HCPCS Codes may vary by state. States should use HCPCS Codes and criteria that best reflect state policy and coding. For site-specific information on MOUD HCPCS codes, see ***Appendix D.*** 2. Exclude claims for prescription sublingual buprenorphine with a negative, missing, or zero days' supply. For a visual representation of the operational definition, population, and lookback period, please see ***Appendix E***. **Community Attribution:** Identify HCS communities by location of residence. Use the most recent residence record from the population (12 months prior to measurement period, plus measurement period) to determine HCS community. If an individual receives MOUD twice in multiple HCS communities based on residence, attribute the individual to the most recent community during the measurement period. **Note**: This measure does not require continuous enrollment during the measurement period.
Stratifications	**Age:** 18–34, 35–54, 55–64 years, calculated as of last day of measurement period **Sex:** Male, female **Race/Ethnicity:** Hispanic, Non-Hispanic White, Non-Hispanic Black, Non-Hispanic Other, missing
Limitations	To harmonize data across four states, all states will calculate and report this measure from among the Medicaid population only. Because this measure is constructed from among individuals who had an OUD diagnosis encounter for whom an ICD-10-CM Diagnosis Code of F11.1X or F11.2X ("opioid abuse" or "opioid dependence") was used, it will exclude from the population individuals with an undiagnosed OUD, and those who were diagnosed in an encounter for which Medicaid was not the primary payer. Kentucky's Medicaid program expanded coverage to include methadone for OUD treatment starting in July 2019.
Resources	Jones CM, Han B, Baldwin GT, Einstein EB, Compton WM. Use of Medication for Opioid Use Disorder Among Adults With Past-Year Opioid

	Use Disorder in the US, 2021. JAMA Netw Open. 2023 Aug 1;6(8):e2327488. https://doi.org/10.1001/jamanetworkopen.2023.27488 Wolters Kluwer. (2020). Medi-Span Electronic Drug File (MED-File) v2.

M 2.5.5: Number of individuals who received buprenorphine for treatment of OUD (Medicaid)

Measure Description	Number of individuals enrolled in Medicaid aged 18-64 diagnosed with OUD within 12 months of the measurement period who received buprenorphine products that are FDA approved for the treatment of OUD.
Background	It is estimated that only 22% of adults in the U.S. with OUD received MOUD in 2021 (Jones et al, 2023). Receipt of treatment among individuals with OUD is used as a quality indicator of health care delivery systems (e.g., Healthcare Effectiveness Data and Information Set). MOUD is a component of best-practice treatment for OUD and may include buprenorphine.
Data Sources	Administrative Medicaid claims data **Kentucky:** Kentucky Cabinet for Health and Family Services, Department for Medicaid Services **Massachusetts:** Massachusetts Executive Office of Health and Human Services **New York:** New York State Department of Health, Office of Health Insurance Programs **Ohio:** Ohio Department of Medicaid
Measurement Periods	Quarter, calendar year, and HCS evaluation period (July 1, 2021–June 30, 2022)
Population	1. Identify all Medicaid enrollees who were 18 to 64 years of age at any point during the measurement period and who were not dual eligible (for Medicaid and Medicare) in the first month of the measurement period. 2. Limit to individuals residing in HCS communities. 3. Count unique individuals with an OUD (ICD-10-CM Diagnosis Code of F11.1X or F11.2X) in any setting (inpatient, outpatient, or professional claims), in any position during the 12 months preceding or during the measurement period. (For the full list of ICD-10-CM Diagnosis Codes and descriptions, please see https://icd10cmtool.cdc.gov/?fy=FY2021.) This is the population definition. Note that this population is not the same as the operational definition of M 2.4 due to the longer lookback period.
Operational Definition	1. Of individuals in the population, count unique individuals who had at least one claim with a National Drug Code (NDC) number or a Healthcare Common Procedure Coding System (HCPCS) code—for buprenorphine during the measurement period. (For a description of

	how NDCs were included in the measures, please see ***Appendix C***.) This is the operational definition. Use the NDC list to identify claims for buprenorphine. Use HCPCS codes for buprenorphine. HCPCS codes may vary by state. States should use HCPCS codes and criteria that best reflect state policy and coding. For site-specific information on MOUD HCPCS codes, see ***Appendix D.*** 2. Exclude claims for prescription sublingual buprenorphine with a negative, missing, or zero days' supply. For a visual representation of the operational definition, population, and lookback period, please see ***Appendix E***. **Community Attribution:** Identify HCS communities by location of residence. Use the most recent residence record from the population (12 months prior to measurement period, plus measurement period) to determine HCS community. If an individual receives buprenorphine twice in multiple HCS communities based on residence, attribute the individual to the most recent community during the measurement period. **Note**: This measure does not require continuous enrollment during the measurement period.
Stratifications	**Age:** 18–34, 35–54, 55–64 years, calculated as of last day of measurement period **Sex:** Male, female **Race/Ethnicity:** Hispanic, Non-Hispanic White, Non-Hispanic Black, Non-Hispanic Other, missing
Limitations	To harmonize data across four states, all states will calculate and report this measure from among the Medicaid population only. Because this measure is constructed from among individuals who had an OUD diagnosis encounter for whom an ICD-10-CM Diagnosis Code of F11.1X or F11.2X ("opioid abuse" or "opioid dependence") was used, it will exclude from the population individuals with an undiagnosed OUD, and those who were diagnosed in an encounter for which Medicaid was not the primary payer. Additionally, it will not capture MOUD for which Medicaid was not the primary payer.
Resources	Jones CM, Han B, Baldwin GT, Einstein EB, Compton WM. Use of Medication for Opioid Use Disorder Among Adults With Past-Year Opioid Use Disorder in the US, 2021. JAMA Netw Open. 2023 Aug 1;6(8):e2327488. https://doi.org/10.1001/jamanetworkopen.2023.27488 Wolters Kluwer. (2020). Medi-Span Electronic Drug File (MED-File) v2.

M 2.6: Number of individuals with OUD who received behavioral health treatment (Medicaid)

Measure Description	Number of individuals enrolled in Medicaid aged 18-64 diagnosed with OUD within 12 months of the measurement period who received behavioral health (BH) treatment for opioid use, dependence, or abuse.
Background	BH treatment is considered a component of best-practice treatment for OUD. Receipt of BH treatment among persons with an OUD is used as a quality indicator of health care delivery systems (e.g., Healthcare Effectiveness Data and Information Set).
Data Sources	Administrative Medicaid claims data **Kentucky:** Kentucky Cabinet for Health and Family Services, Department for Medicaid Services **Massachusetts:** Massachusetts Executive Office of Health and Human Services **New York:** New York State Department of Health, Office of Health Insurance Programs **Ohio:** Ohio Department of Medicaid
Measurement Periods	Quarter, calendar year, and HCS evaluation period (July 1, 2021–June 30, 2022)
Population	1. Identify all Medicaid enrollees who were 18 to 64 years of age at any point during the measurement period and who were not dual eligible (for Medicaid and Medicare) during the first month of the measurement period. 2. Limit to individuals residing in HCS communities. If an individual resides in multiple counties throughout the measurement period, choose the most recent community during the measurement period. 3. Count unique individuals with an OUD (ICD-10-CM Diagnosis Code of F11.1X or F11.2X) in any setting (inpatient, outpatient, or professional claims), in any position during the 12 months preceding or during the measurement period. (For the full list of ICD-10-CM Diagnosis Codes and descriptions, please see https://icd10cmtool.cdc.gov/?fy=FY2021.) This is the population for Measures 2.6.1 through 2.6.7.

Operational Definition

Submeasures 2.6.1 through 2.6.7 capture various types and intensities of BH treatment.

1. For each Submeasure, count individuals in the population who had at least one claim for the specified type of BH treatment during the measurement period (see codes for each measure below). BH treatment claims must also have at least one of the following ICD-10-CM Diagnosis codes, in any position on the claim, in order to count for the operational definition (for ICD-10-CM Diagnosis Codes, Procedure Codes, and descriptions, please see https://icd10cmtool.cdc.gov/?fy=FY2021.):

   F11.1 (Opioid abuse)

   F11.2 (Opioid dependence)

   F11.9 (Opioid use, Unspecified)

2. Count the number of individuals with a qualifying BH treatment claim for each M 2.6 measure independently, from M 2.6.1 through M 2.6.7, and report as the operational definition for the corresponding Submeasure.

Community Attribution: Identify HCS communities by location of residence. Use the most recent residence record from the population (12 months prior to measurement period, plus measurement period) to determine HCS community.

Note: This measure does not require continuous enrollment during the measurement period.

To look up behavioral health codes, see ***Appendix F***.

Submeasures

For the full list of Submeasures in M 2.6, please see the Measures Specifications table below.

M 2.6.1: Number of individuals with OUD who received behavioral health treatment in inpatient settings (Medicaid)

This Submeasure includes treatment at levels 3 (residential) and 4 (inpatient) per the American Society of Addiction Medicine [ASAM] Criteria.*

Qualifying Services*	State-specific Modifications
Revenue Codes: 116, 126, 136, 146, 156, 1002 **Place of Service (POS) Code:** 55 **ICD-10-PCS Code:** HZ2ZZZZ Healthcare Common Procedure Coding System (HCPCS) Codes: H0009, H0010, H0011, H0012, H2034, H2036, H0019	Kentucky excluded POS Code 55; used in ASAM Level 1 (M 2.6.3)

M 2.6.2: Number of individuals with OUD who received behavioral health treatment in intensive outpatient settings (Medicaid)

This Submeasure includes treatment at level 2 (intensive outpatient) per the American Society of Addiction Medicine [ASAM] Criteria.*

Qualifying Services*	State-specific Modifications
Revenue Codes: 905, 906, 912, 913 **Healthcare Common Procedure Coding System (HCPCS) Codes:** H0015, H0017, H0035, S9480	N/A

M 2.6.3: Number of individuals with OUD who received behavioral health treatment in outpatient settings (Medicaid)

This Submeasure includes treatment at level 1 (outpatient) per the American Society of Addiction Medicine [ASAM] Criteria.*

Qualifying Services*	State-specific Modifications
Revenue Codes: 944, 945 **Current Procedural Terminology/ Healthcare Common Procedure Coding System (CPT/HCPCS) Codes:** 90791, 90792, 90832, 90833, 90834, 90836, 90837, 90838, 90839, 90845, 90846, 90847, 90849, 90853, 90863, 90865, 90875, 90876, 90877, 90882, 97810, 97811, 99201, 99202, 90203, 90204, 90205, 99211, 99212, 99213, 99214, 99215, G0396, G0397, G0463, G0466, G0467, G0469, G0470, H0004, H0005, H0014, H0016, H0020, H0022, H0023, H0031, H0032, H0033, H0036, H0037, H0046, H0047, H0050, H2000, H2001, H2010, H2012, H2013, H2014, H2015, H2016, H2017, H2018, H2019, H2020, H2021, H2022, H2023, H2024, H2025, H2026, H2027, H2032, H5030, H5299, S9454, S9475, T1006, T1012, T1015, T1023, T1040, T1041, T2010, T2011	Ohio considered any services billed by Provider Type 95 (substance use disorder treatment center) that is not already captured in ASAM levels 2, 3, 4, as ASAM level 1. H0020: Kentucky needs HF modifier H0033: Kentucky only, needs an HF modifier H2015: Kentucky, Ohio only H2016: Kentucky, Ohio, New York only

M 2.6.4: Number of individuals with OUD who received behavioral health treatment in any setting (Medicaid)

This Submeasure includes treatment at levels 1 (outpatient), 2 (intensive outpatient), 3 (residential) and 4 (inpatient) per the American Society of Addiction Medicine [ASAM] Criteria.*

Qualifying Services*	State-specific Modifications
Any of the qualifying services for M 2.6.1, M 2.6.2, 2.6.3	**Any of the state-specific modifications for** M 2.6.1, M 2.6.2, 2.6.3

M 2.6.5: Number of individuals with OUD who received case management (Medicaid)

Qualifying Services*	State-specific Modifications
Healthcare Common Procedure Coding System (HCPCS) Codes: H0006, H2015, G0502, G0503, T1016, T1017, T2023	H2015: Massachusetts only; considered ASAM Level 1 (M 2.6.3) for Kentucky and Ohio

M 2.6.6: Number of individuals with OUD who received peer support (Medicaid)

Qualifying Services*	State-specific Modifications
Healthcare Common Procedure Coding System (HCPCS) Codes: H0038, H2016	H2016: Massachusetts only; used as code for recovery coach; considered ASAM Level 1 (M 2.6.3) for other sites

M 2.6.7: Number of individuals with OUD who received case management and/or peer support (Medicaid)

Qualifying Services*	State-specific Modifications
Any of the qualifying services for M 2.6.5, M 2.6.6	**Any of the state-specific modifications for** M 2.6.5, M 2.6.6

Submeasure Notes:
ASAM = American Society of Addiction Medicine; HCPCS = Healthcare Common Procedure Coding System; CPT = Current Procedural Terminology.

*ASAM Levels:

Level 3.1 is clinically managed low-intensity residential treatment. Residential services at this level consist of a setting, such as a group home, where people live. However, treatment is only required to be 5 hours per week, which helps people with such topics as relapse management.

Level 3.3 is clinically managed high-intensity and population-specific services. These programs are targeted for providing treatment designed to move at a slower pace, for people with cognitive functioning issues,

	including people with traumatic brain injuries, the elderly, or people with developmental disabilities. **Level 3.5** is clinically managed residential services. These services are designed for people with serious psychological or social issues who need 24-hour oversight and are at risk of imminent harm. **Level 3.7** is medically managed high-intensity inpatient treatment. These services are for people who need intensive medical or psychological monitoring in a 24-hour setting but do not need daily physician interaction. **Level 4** provides 24-hour nursing care and daily physician visits. People in this level of care need daily physician monitoring, along with 24-hour oversight. https://americanaddictioncenters.org/rehab-guide/asam-criteria-levels-of-care
Stratifications	**Age:** 18–34, 35–54, 55–64 years, calculated as of last day of measurement period **Sex:** Male, female **Race/Ethnicity:** Hispanic, Non-Hispanic White, Non-Hispanic Black, Non-Hispanic Other, missing
Limitations	This measure is limited to individuals who were enrolled in Medicaid, meaning the operational definition is limited to individuals who had a medical encounter with an OUD diagnosis for whom an ICD-10-CM Diagnosis Code of F11.1X or F11.2X (“opioid abuse” or “opioid dependence”) was used, for which Medicaid was the primary payer. Individuals with an undiagnosed OUD will be missed, and encounters for which Medicaid was not the primary payer will be missed. Because this measure assigns enrollees to an HCS community based on residence, individuals who are diagnosed with OUD in the HCS community but reside elsewhere will not be included in analysis. Behavioral health interventions that are administered as part of a non-Medicaid funded community effort will be missed.

M 2.7.1: Number of individuals who received buprenorphine for treatment of opioid use disorder (OUD) that are retained at least 180 days

Measure Description	Number of individuals aged 18+ who received buprenorphine products that are FDA-approved for the treatment of opioid use disorder and are retained in treatment at least 180 days.
Background	It is estimated that only 22% of adults in the U.S. with OUD received MOUD in 2021 (Jones et al, 2023). Even fewer are believed to be retained in treatment for at least 180 days. Retention in treatment among individuals

	with OUD is used as a quality indicator of health care delivery systems (e.g., Healthcare Effectiveness Data and Information Set). MOUD is a component of best-practice treatment for OUD and may include buprenorphine.
Data Sources	PDMP data **Kentucky:** Kentucky Cabinet for Health and Family Services, Office of Inspector General, Division of Audits and Investigations **Massachusetts:** Massachusetts Department of Public Health, Office of Prescription Monitoring and Drug Control **New York:** New York State Department of Health, Bureau of Narcotic Enforcement and New York State Department of Health, Office of Science **Ohio:** Ohio Board of Pharmacy
Measurement Periods	Month, quarter, calendar year, and HCS evaluation period (July 1, 2021–June 30, 2022)
Population	Number of individuals receiving buprenorphine products that are FDA approved for treatment of OUD (HCS Measure 2.5.1) in the corresponding measurement period six months prior.
Operational Definition	Number of unique individuals aged 18+ who maintained continual MOUD treatment with buprenorphine for at least 180 days during the measurement period. Continuous treatment is calculated based on days supplied. An individual can have gaps in treatment of up to 7 days and still be considered as having been in continuous treatment. ***Appendix B*** contains detailed specifications for developing a PDMP analytic data set. 1. For each prescription in the table created in step M in ***Appendix B***, use the date filled and days supplied to calculate a run-out date (date of filled prescription + days supplied -1). 2. Compare the fill dates and run-out dates of each prescription. If one prescription completely overlaps a prescription with a shorter duration and an earlier run-out date (fill date B ≥ fill date A and run-out date B < run-out date A) then remove the prescription with the shorter duration. 3. Calculate the days between the run-out date of each filled prescription and the fill date of the subsequent prescription. This is the treatment gap. If there is no subsequent prescription fill, use the end date from step A in ***Appendix B*** to calculate a treatment gap between the final run-out date for each patient and the end date. 4. Group consecutive prescriptions without a gap of >7 days as a period of continual treatment. 5. Flag all periods of continual treatment with a duration ≥180 days.

	6. For periods of continual treatment flagged in step 5, calculate the date where the continual period reaches 180 days (minimum fill date in the period + 179). This is the threshold date. 7. Flag the maximum run-out date for each continual period. This is the period end date. 8. Flag all months where a patient was in a period of continual treatment (≥180 days). 9. From the flagged months in step 8, delete any months prior to the month in which the patient turned 18 years of age. 10. From the table created in step 9, select all unique combinations of patient ID, year, quarter, and month. 11. Join the table created in step 10 with the table created in step J of ***Appendix B*** on patient ID, year, and month. 12. Join the table created in step 10 with the table created in step K of ***Appendix B*** on patient ID, year, and quarter. 13. Join the table created in step 10 with the table created in step L of ***Appendix B*** on patient ID and year, creating separate counts for both calendar (January–December) and comparison (July–June) years. 14. Create monthly counts of unique patients by HCS community from the table created in step 11, quarterly counts of unique patients by HCS community from the table created in step 12, and yearly counts of unique patients by HCS community from the table created in step 13. **Community Attribution:** Identify HCS communities by location of residence. **Note:** This measure captures dispensed prescriptions with National Drug Code (NDC) numbers for buprenorphine products that are approved by the FDA for the treatment of OUD. (For a description of how NDCs were included in the measures, please see ***Appendix C***.) The NDC list is updated quarterly by the HCS team using the Medi-Span Electronic Drug File (MED-File) v2 for active and inactive products (Wolters Kluwer, 2020). Buprenorphine products directly purchased for administration in practitioner offices (i.e., products that are not first dispensed by pharmacies) are not captured in PDMP data. Transdermal, parenteral, and buccal formulations of buprenorphine approved for treatment of pain are excluded.
Stratifications	For calendar year and evaluation period only. **Age:** 18–34, 35–54, 55+ years Create stratified annual counts using the age of each patient. Calculate this with the date of birth selected in Step E and the end date of each annual period (calendar year or evaluation period). An individual patient should not be counted in more than one age stratum in the same annual period. **Sex:** Male, female, missing

	Use the sex that appears on each patient's final record of the annual period (calendar year or evaluation period). An individual patient should not be counted in more than one sex stratum in the same annual period.
Limitations	In order to measure at least 180 days of treatment, this measure's population is the number of individuals who received buprenorphine for treatment of OUD (Measure 2.5.1) in the corresponding measurement period six months prior. Because the measurement periods for this measure and its population differ, it is possible they may contain different groups of people and may result in instances where the population (M 2.5.1) is smaller than expected.
Resources	Jones CM, Han B, Baldwin GT, Einstein EB, Compton WM. Use of Medication for Opioid Use Disorder Among Adults With Past-Year Opioid Use Disorder in the US, 2021. JAMA Netw Open. 2023 Aug 1;6(8):e2327488. https://doi.org/10.1001/jamanetworkopen.2023.27488 Wolters Kluwer. (2020). Medi-Span Electronic Drug File (MED-File) v2. National Quality Forum. (2019). Continuity of pharmacotherapy for opioid use disorder (OUD)–national quality strategy domain: effective clinical care–meaningful measure area: prevention and treatment of opioid and substance use disorders. https://qpp.cms.gov/docs/QPP_quality_measure_specifications/CQM-Measures/2019_Measure_468_MIPSCQM.pdf

M 2.7.2: Number of individuals receiving methadone retained at least 180 days (Medicaid)

Measure Description	Number of individuals enrolled in Medicaid aged 18-64 diagnosed with OUD within 12 months of the measurement period who received methadone for at least 180 days.
Background	It is estimated that only 22% of adults in the U.S. with an OUD received MOUD in 2021 (Jones et al, 2023). Even fewer are believed to be retained in treatment for at least 180 days. Retention in treatment among individuals with OUD is used as a quality indicator of health care delivery systems (e.g., Healthcare Effectiveness Data and Information Set). MOUD is a component of best-practice treatment for OUD and may include methadone.
Data Sources	Administrative Medicaid claims data **Kentucky:** Kentucky Cabinet for Health and Family Services, Department for Medicaid Services **Massachusetts:** Massachusetts Executive Office of Health and Human Services **New York:** New York State Department of Health, Office of Health Insurance Programs

	Ohio: Ohio Department of Medicaid
Measurement Periods	Quarter, calendar year, and HCS evaluation period (July 1, 2021–June 30, 2022)
Population	1. Identify all Medicaid enrollees who were 18 to 64 years of age at any point during the measurement period and were not dual eligible (for Medicaid and Medicare) during the first month of the measurement period. 2. Of these, limit to individuals residing in HCS communities. If an individual resides in multiple communities throughout the measurement period, choose the most recent community during the measurement period. 3. Of these, limit to individuals with an OUD (ICD-10-CM Diagnosis Code of F11.1X or F11.2X) in any setting (inpatient, outpatient, or professional claims), in any position during the12 months preceding or during the measurement period. (For the full list of ICD-10-CM Diagnosis Codes and descriptions, please see https://icd10cmtool.cdc.gov/?fy=FY2021.) 4. For individuals identified in steps 1 through 3, identify claims for methadone. This measure considers only office-administered methadone claims, not prescription fills for methadone claims, which may be for pain management. All states use Healthcare Common Procedure Coding System (HCPCS) code H0020 to identify methadone, but apply the following state specific criteria to reflect state billing policy and coding. For site-specific information on methadone HCPCS codes, see ***Appendix D.*** 5. Sort claims for each individual by date of service and construct spans of continuous treatment with methadone, considering the following: An individual can have gaps in treatment of up to 7 days to be considered as having been in continuous treatment. No surplus day's coverage is accumulated for claims that occur on the same day or before the end of days covered by an earlier claim. 6. Of continuous spans of treatment, limit to those that began between (Measurement Period Start − 180) and (Measurement Period End − 180) and for which the first date of treatment was followed by continuous enrollment in Medicaid for at least 180 days. 7. Count the number of individuals with at least one qualifying treatment span. A qualifying span can be as short as 1 day of coverage, and an individual may have more than one span. For example, the population for calendar year 2018 will include all spans that began between (01/01/2018 – 180) and (12/31/2018 – 180). If an individual had any qualifying span of treatment beginning in this period, they are in the population.

	Note: Spans that began before the 180-day lookback period and continue into it are treated as if the 180-day lookback start date were the first day of the treatment span.
Operational Definition	1. Of population-compliant spans, identify those of 180 days or more. Total length in days is calculated as (Treatment End − Treatment Start + 1). All operational definition-compliant spans will have endpoints during the measurement period. **Note:** Spans that continue beyond the measurement period end date are treated as if measurement period end date is the end of the treatment span. 2. Count unique individuals who had at least one treatment span lasting at least 180 days. This is the operational definition. For a visual representation of the operational definition, population, and lookback period, please see ***Appendix E***. **Community Attribution:** Identify HCS communities by location of residence. Use the most recent residence record from the population (12 months prior to measurement period, plus measurement period) to determine HCS community.
Stratifications	For calendar year and evaluation period only. **Age:** 18–34, 35–54, 55–64 years, calculated as of last day of measurement period **Sex:** Male, female **Race/Ethnicity:** Hispanic, Non-Hispanic White, Non-Hispanic Black, Non-Hispanic Other, missing
Limitations	This measure will exclude individuals with an undiagnosed OUD, and relies on methadone reporting, including days' supply. This measure assumes that all methadone prescriptions that are retainable are consumed by the individual to whom they are prescribed. Individuals that began treatment with methadone and switched to a different MOUD drug would be included in the population but excluded from the operational definition, even if they maintained continuous treatment while switching types. Kentucky's Medicaid program expanded coverage to include methadone for OUD treatment starting in July 2019.
Resources	Jones CM, Han B, Baldwin GT, Einstein EB, Compton WM. Use of Medication for Opioid Use Disorder Among Adults With Past-Year Opioid Use Disorder in the US, 2021. JAMA Netw Open. 2023 Aug 1;6(8):e2327488. https://doi.org/10.1001/jamanetworkopen.2023.27488 National Quality Forum. (2019). Continuity of pharmacotherapy for opioid use disorder (OUD)–national quality strategy domain: effective clinical care–meaningful measure area: prevention and treatment of opioid and substance use disorders.

	https://qpp.cms.gov/docs/QPP_quality_measure_specifications/CQM-Measures/2019_Measure_468_MIPSCQM.pdf

M 2.7.3: Number of individuals who received naltrexone (combined injectable and oral) for at least 180 days (Medicaid)

Measure Description	Number of individuals enrolled in Medicaid aged 18-64 diagnosed with OUD within 12 months of the measurement period who received naltrexone for at least 180 days.
Background	It is estimated that only 22% of adults in the U.S. with an OUD received MOUD in 2021 (Jones et al, 2023). Even fewer are believed to be retained in treatment for at least 180 days. Retention in treatment among individuals with OUD is used as a quality indicator of health care delivery systems (e.g., Healthcare Effectiveness Data and Information Set). MOUD is a component of best-practice treatment for OUD and may include naltrexone.
Data Sources	Administrative Medicaid claims data **Kentucky:** Kentucky Cabinet for Health and Family Services, Department for Medicaid Services **Massachusetts:** Massachusetts Executive Office of Health and Human Services **New York:** New York State Department of Health, Office of Health Insurance Programs **Ohio:** Ohio Department of Medicaid
Measurement Periods	Quarter, calendar year, and HCS evaluation period (July 1, 2021–June 30, 2022)
Population	1. Identify all Medicaid enrollees who were 18 to 64 years of age at any point during the measurement period and were not dual eligible (for Medicaid and Medicare) during the first month of the measurement period. 2. Of these, limit to individuals residing in HCS communities. If an individual resides in multiple communities throughout the measurement period, choose the most recent community during the measurement period. 3. Of these, limit to individuals with an OUD (ICD-10-CM Diagnosis Code of F11.1X or F11.2X) in any setting (inpatient, outpatient, or professional claims), in any position during the 12 months preceding or during the measurement period. (For the full list of ICD-10-CM Diagnosis Codes and descriptions, please see https://icd10cmtool.cdc.gov/?fy=FY2021.) 4. For individuals identified in steps 1 through 3, identify claims for naltrexone. This measure considers oral naltrexone or injectable naltrexone.

	Use National Drug Code (NDC) numbers for naltrexone. (For a description of how NDCs were included in the measures, please see ***Appendix C***.) Use Healthcare Common Procedure Coding System (HCPCS) codes for naltrexone. HCPCS codes may vary by state. States should use States should use HCPCS codes and criteria that best reflect state policy and coding. For site-specific information on naltrexone HCPCS codes, see ***Appendix D.*** 5. Sort claims for each individual by date of service and construct spans of continuous treatment with naltrexone, considering the following: Injections contribute 28 days' supply unless another claim is found sooner or unless days' supply is specified in claim or code documentation. An individual can have gaps in treatment of up to 7 days to be considered as having been in continuous treatment. No rolling surplus is accumulated for injectable naltrexone, but may be accumulated for oral naltrexone. An oral naltrexone span that is interrupted by an injectable naltrexone claim or span does not keep any surplus that was accumulated before the injectable naltrexone claim. For claims that extend beyond the end of the measurement period, consider the last date of measurement period to be equal to the end of the naltrexone span. 6. Of continuous spans of treatment, limit to those that began between (Measurement Period Start − 180) and (Measurement Period End − 180) and for which the first date of treatment was followed by continuous enrollment in Medicaid for at least 180 days. 7. Count the number of individuals with at least one qualifying treatment span. A qualifying span can be as short as 1 day of coverage, and an individual may have more than one span. For example, the population for calendar year 2018 will include all spans that began between (01/01/2018 − 180) and (12/31/2018 − 180). If an individual had any qualifying span of treatment beginning in this period, they are in the population. **Note:** Spans that began before the 180-day lookback period and continue into it are treated as if the 180-day lookback start date were the first day of the treatment span.
Operational Definition	1. Of population-compliant spans, identify those of 180 day or more. Total length in days is calculated as (Treatment End − Treatment Start + 1). All operational definition-compliant spans will have endpoints during the measurement period. **Note:** Spans that continue beyond the measurement period end date are treated as if measurement period end date is the end of the treatment span.

	2. Count unique individuals who had at least one treatment span lasting at least 180 days. This is the operational definition. **Community Attribution:** Identify HCS communities by location of residence. Use the most recent residence record from the population (12 months prior to measurement period, plus measurement period) to determine HCS community.
Stratifications	For calendar year and evaluation period only. **Age:** 18–34, 35–54, 55–64 years, calculated as of last day of measurement period **Sex:** Male, female **Race/Ethnicity:** Hispanic, Non-Hispanic White, Non-Hispanic Black, Non-Hispanic Other, missing
Limitations	This measure will exclude individuals with an undiagnosed OUD, and relies on naltrexone reporting, including days' supply. This measure assumes that all naltrexone prescriptions that are retainable are consumed by the individual to whom they are prescribed. Individuals that began treatment with naltrexone and then switched to a different MOUD drug would be included in the population but excluded from the operational definition, even if they maintained continuous treatment while switching types.
Resources	Jones CM, Han B, Baldwin GT, Einstein EB, Compton WM. Use of Medication for Opioid Use Disorder Among Adults With Past-Year Opioid Use Disorder in the US, 2021. JAMA Netw Open. 2023 Aug 1;6(8):e2327488. https://doi.org/10.1001/jamanetworkopen.2023.27488 Wolters Kluwer. (2020). Medi-Span Electronic Drug File (MED-File) v2. National Quality Forum. (2019). Continuity of pharmacotherapy for opioid use disorder (OUD)–national quality strategy domain: effective clinical care–meaningful measure area: prevention and treatment of opioid and substance use disorders. https://qpp.cms.gov/docs/QPP_quality_measure_specifications/CQM-Measures/2019_Measure_468_MIPSCQM.pdf

M 2.7.3.A: Number of individuals who received naltrexone (injectable only) for treatment of OUD that are retained for at least 180 days (Medicaid)

Measure Description	Number of individuals enrolled in Medicaid aged 18-64 diagnosed with OUD within 12 months of the measurement period who received intramuscular (IM) injectable naltrexone for at least 180 days.
Background	It is estimated that only 22% of adults in the U.S. with an OUD received MOUD in 2021 (Jones et al, 2023). Even fewer are believed to be retained in treatment for at least 180 days. Retention in treatment among individuals with an OUD diagnosis is used as a quality indicator of health care delivery systems (e.g., Healthcare Effectiveness Data and Information Set). MOUD

	is a component of best-practice treatment for OUD and may include naltrexone.
Data Sources	Administrative Medicaid claims data **Kentucky:** Kentucky Cabinet for Health and Family Services, Department for Medicaid Services **Massachusetts:** Massachusetts Executive Office of Health and Human Services **New York:** New York State Department of Health, Office of Health Insurance Programs **Ohio:** Ohio Department of Medicaid
Measurement Periods	Quarter, calendar year, and HCS evaluation period (July 1, 2021–June 30, 2022)
Population	1. Identify all Medicaid enrollees who were 18 to 64 years of age at any point during the measurement period and were not dual eligible (for Medicaid and Medicare) during the first month of the measurement period. 2. Of these, limit to individuals residing in HCS communities. If an individual resides in multiple communities throughout the measurement period, choose the most recent community during the measurement period. 3. Of these, limit to individuals with an OUD (ICD-10-CM Diagnosis Code of F11.1X or F11.2X) in any setting (inpatient, outpatient, or professional claims), in any position during the 12 months preceding or during the measurement period. (For the full list of ICD-10-CM Diagnosis Codes and descriptions, please see https://icd10cmtool.cdc.gov/?fy=FY2021.) 4. For individuals identified in steps 1 through 3, identify claims for naltrexone. This measure considers oral naltrexone and injectable naltrexone. Use National Drug Code (NDC) numbers for naltrexone. (For a description of how NDCs were included in the measures, please see ***Appendix C***.) Use Healthcare Common Procedure Coding System (HCPCS) codes for naltrexone. HCPCS codes may vary by state. States should use HCPCS codes and criteria that best reflect state policy and coding. For site-specific information on naltrexone HCPCS codes, see ***Appendix D.*** 5. Sort injectable naltrexone claims for each individual by date of service and construct spans of continuous treatment with naltrexone, considering the following: Injections contribute 28 days' supply unless another claim is found sooner or unless length is specified in claim or code documentation. An individual can have gaps in treatment of up to 7 days to be considered as having been in continuous treatment.

	No rolling surplus is accumulated for claims that occur on the same day or before the end of days covered by an earlier claim. 6. Next, use the NDC list to identify any claims for oral naltrexone with days' coverage in the 28 days directly preceding the start of an injectable span. If there are consecutive oral naltrexone claims, include the total number of days covered by the oral naltrexone spans (allowing gaps of up to 7 days), as part of the injectable span. Up to 28 days of oral naltrexone preceding an injectable span can count toward the injectable span. 7. Of continuous spans of treatment, limit to those that began between (Measurement Period Start − 180) and (Measurement Period End − 180) and for which the first date of treatment was followed by continuous enrollment in Medicaid for at least 180 days. 8. Count the number of individuals with at least one qualifying treatment span. A qualifying span can be as short as 1 day of coverage, and an individual may have more than one span. For example, the population for calendar year 2018 will include all spans that began between (01/01/2018 − 180) and (12/31/2018 − 180). If an individual had any qualifying span of treatment beginning in this period, they are in the population. **Note:** Spans that began before the 180-day lookback period and continue into it are treated as if the 180-day lookback start date were the first day of the treatment span.
Operational Definition	1. Of population-compliant spans, identify those of 180 day or more. Total length in days is calculated as (Treatment End − Treatment Start + 1). All operational definition-compliant spans will have endpoints during the measurement period. **Note:** Spans that continue beyond the Measurement Period End date are treated as if Measurement Period End date is the end of the treatment span. 2. Count unique individuals who had at least one treatment span lasting at least 180 days. This is the operational definition. For a visual representation of the operational definition, population, and lookback period, please see ***Appendix E***. **Community Attribution:** Identify HCS communities by location of residence. Use the most recent residence record from the population (measurement period plus the 12 months preceding the measurement period) to determine HCS community. **Note**: Spans of continuous intramuscular (IM) injectable naltrexone may include up to 28 days of oral naltrexone prior to injectable treatment claims as induction.
Stratifications	For calendar year and evaluation period only.

	Age: 18–34, 35–54, 55–64 years, calculated as of last day of measurement period **Sex:** Male, female **Race/Ethnicity:** Hispanic, Non-Hispanic White, Non-Hispanic Black, Non-Hispanic Other, missing
Limitations	This measure will exclude individuals with an undiagnosed OUD, and relies on naltrexone reporting, including days' supply. This measure assumes that all naltrexone prescriptions that are retainable are consumed by the individual to whom they are prescribed. Individuals who began treatment with naltrexone and switched to a different MOUD drug would be included in the population but excluded from the operational definition, even if they maintained continuous treatment while switching types.
Resources	Jones CM, Han B, Baldwin GT, Einstein EB, Compton WM. Use of Medication for Opioid Use Disorder Among Adults With Past-Year Opioid Use Disorder in the US, 2021. JAMA Netw Open. 2023 Aug 1;6(8):e2327488. https://doi.org/10.1001/jamanetworkopen.2023.27488 Wolters Kluwer. (2020). Medi-Span Electronic Drug File (MED-File) v2. National Quality Forum. (2019). Continuity of pharmacotherapy for opioid use disorder (OUD)–national quality strategy domain: effective clinical care–meaningful measure area: prevention and treatment of opioid and substance use disorders. https://qpp.cms.gov/docs/QPP_quality_measure_specifications/CQM-Measures/2019_Measure_468_MIPSCQM.pdf

M 2.7.3.B: Number of individuals who receive naltrexone (oral only) for treatment of OUD that are retained at least 180 days (Medicaid)

Measure Description	Number of individuals enrolled in Medicaid aged 18-64 diagnosed with OUD within 12 months of the measurement period who received prescription oral naltrexone for at least 180 days.
Background	It is estimated that only 22% of adults in the U.S. with an OUD received MOUD in 2021 (Jones et al, 2023). Even fewer are believed to be retained in treatment for at least 180 days. Retention in treatment among individuals with OUD is used as a quality indicator of health care delivery systems (e.g., Healthcare Effectiveness Data and Information Set). MOUD is a component of best-practice treatment for OUD and may include naltrexone.
Data Sources	Administrative Medicaid claims data **Kentucky:** Kentucky Cabinet for Health and Family Services, Department for Medicaid Services **Massachusetts:** Massachusetts Executive Office of Health and Human Services

	New York: New York State Department of Health, Office of Health Insurance Programs **Ohio:** Ohio Department of Medicaid
Measurement Periods	Quarter, calendar year, and HCS evaluation period (July 1, 2021–June 30, 2022)
Population	1. Identify all Medicaid enrollees who were 18 to 64 years of age at any point during the measurement period and were not dual eligible (for Medicaid and Medicare) during the first month of the measurement period. 2. Of these, limit to individuals residing in HCS communities. If an individual resides in multiple communities throughout the measurement period, choose the most recent community during the measurement period. 3. Of these, limit to individuals with an OUD (ICD-10-CM Diagnosis Code of F11.1X or F11.2X) in any setting (inpatient, outpatient, or professional claims), in any position during the 12 months preceding or during the measurement period. (For the full list of ICD-10-CM Diagnosis Codes and descriptions, please see https://icd10cmtool.cdc.gov/?fy=FY2021.) 4. For individuals identified in steps 1 through 3, identify claims for oral naltrexone. Use National Drug Code (NDC) numbers for oral naltrexone. (For a description of how NDCs were included in the measures, please see ***Appendix C***.) 5. Sort claims for each individual by date of service and construct spans of continuous treatment with oral naltrexone, considering the following: An individual can have gaps in treatment of up to 7 days to be considered as having been in continuous treatment. A rolling surplus is accumulated for claims that occur on the same day or before the end of days covered by an earlier claim. 6. Of continuous spans of treatment, limit to spans of at least 28 days. A span of oral naltrexone treatment can be initiated by either one prescription for treatment totaling at least 28 days or several brief prescriptions for treatment totaling 28 days. 7. Of these, limit to those that began between (Measurement Period Start − 180) and (Measurement Period End − 180) and for which the first date of treatment was followed by continuous enrollment in Medicaid for at least 180 days. 8. Count the number of individuals with at least one qualifying treatment span. A qualifying span can be as short as 28 days of coverage, and an individual may have more than one span. For example, the population for calendar year 2018 will include all spans that began between (01/01/2018 − 180) and (12/31/2018 − 180). If an individual had any

	qualifying span of treatment beginning in this period, they are in the population. **Note:** Spans that began before the 180-day lookback period and continue into it are treated as if the 180-day lookback start date were the first day of the treatment span. **Note:** This measure only considers individuals who have at least 28 days of oral naltrexone coverage for the population, as shorter treatment spans may represent induction to injectable naltrexone treatment regimens.
Operational Definition	1. Of population-compliant spans, identify those of 180 day or more. Total length in days is calculated as (Treatment End − Treatment Start + 1). All operational definition-compliant spans will have endpoints during the measurement period. **Note:** Spans that continue beyond the measurement period end date are treated as if measurement period end date is the end of the treatment span. 2. Count unique individual who had at least one treatment span lasting at least 180 days. This is the operational definition. For a visual representation of the operational definition, population, and lookback period, please see ***Appendix E***. **Community Attribution:** Identify HCS communities by location of residence. Use the most recent residence record from the population period (12 months prior to measurement period, plus measurement period) to determine HCS community.
Stratifications	For calendar year and evaluation period only. **Age:** 18–34, 35–54, 55–64 years, calculated as of last day of measurement period **Sex:** Male, female **Race/Ethnicity:** Hispanic, Non-Hispanic White, Non-Hispanic Black, Non-Hispanic Other, missing
Limitations	This measure will exclude individuals with an undiagnosed OUD, and relies on naltrexone reporting, including days' supply. This measure assumes that all naltrexone prescriptions that are retainable are consumed by the individual to whom they are prescribed. Individuals that began treatment with naltrexone and switched to a different MOUD drug would be included in the population but excluded from the operational definition, even if they maintained continuous treatment while switching types.
Resources	Jones CM, Han B, Baldwin GT, Einstein EB, Compton WM. Use of Medication for Opioid Use Disorder Among Adults With Past-Year Opioid Use Disorder in the US, 2021. JAMA Netw Open. 2023 Aug 1;6(8):e2327488. https://doi.org/10.1001/jamanetworkopen.2023.27488 Wolters Kluwer. (2020). Medi-Span Electronic Drug File (MED-File) v2.

	National Quality Forum. (2019). Continuity of pharmacotherapy for opioid use disorder (OUD)–national quality strategy domain: effective clinical care–meaningful measure area: prevention and treatment of opioid and substance use disorders. https://qpp.cms.gov/docs/QPP_quality_measure_specifications/CQM-Measures/2019_Measure_468_MIPSCQM.pdf

M 2.7.4: Number of individuals with who received medication for treatment of OUD that are retained at least 180 days (Medicaid)

Measure Description	Number of individuals enrolled in Medicaid aged 18-64 diagnosed with opioid use disorder (OUD) within 12 months of the measurement period who received a medication for OUD for at least 180 days.
Background	It is estimated that only 22% of adults in the U.S. with an OUD received MOUD in 2021 (Jones et al, 2023). Even fewer are believed to be retained in treatment for at least 180 days. Retention in treatment among individuals with OUD is used as a quality indicator of health care delivery systems (e.g., Healthcare Effectiveness Data and Information Set). MOUD is a component of best-practice treatment for OUD and may include one or more types of MOUD.
Data Sources	Administrative Medicaid claims data **Kentucky:** Kentucky Cabinet for Health and Family Services, Department for Medicaid Services **Massachusetts:** Massachusetts Executive Office of Health and Human Services **New York:** New York State Department of Health, Office of Health Insurance Programs **Ohio:** Ohio Department of Medicaid
Measurement Periods	Quarter, calendar year, and HCS evaluation period (July 1, 2021–June 30, 2022)
Population	1. Identify all Medicaid enrollees who were 18 to 64 years of age at any point during the measurement period and were not dually eligible for Medicare and Medicaid during the first month of the measurement period. 2. Of these, limit to individuals residing in HCS communities. If an individual resides in multiple communities throughout the measurement period, choose the most recent community during the measurement period. 3. Of these, limit to individuals with an OUD (ICD-10-CM Diagnosis Code of F11.1X or F11.2X) in any setting (inpatient, outpatient, or professional claims), in any position during the 12 months preceding or during the measurement period. (For the full list of ICD-10-CM

	Diagnosis Codes and descriptions, please see https://icd10cmtool.cdc.gov/?fy=FY2021.) 4. For individuals identified in steps 1 through 3, identify claims for MOUD. This measure considers all modalities of methadone, naltrexone, and buprenorphine. Use National Drug Code (NDC) numbers for MOUD. (For a description of how NDCs were included in the measures, please see ***Appendix C***.) Use Healthcare Common Procedure Coding System (HCPCS) codes for MOUD. HCPCS codes may vary by state. States should use HCPCS codes and criteria that best reflect state policy and coding. For site-specific information on MOUD HCPCS codes, see ***Appendix D.*** 5. Sort claims for each individual by date of service and construct spans of continuous treatment with MOUD, considering the following: An individual can have gaps in treatment of up to 7 days to be considered as having been in continuous treatment. A rolling surplus is accumulated for oral claims that occur on the same day or before the end of days covered by an earlier claim No rolling surplus is accumulated for office administered or injectable MOUD claims that occur on the same day or before the end of days covered by an earlier claim If a claim for injectable MOUD falls within an oral treatment span that has accumulated a rolling surplus, the surplus oral days are ignored; they cannot be applied to days following the injectable MOUD administration. 6. Of continuous spans of treatment, limit to those that began between (Measurement Period Start − 180) and (Measurement Period End − 180) and for which the first date of treatment was followed by continuous enrollment in Medicaid for at least 180 days. 7. Count the number of individuals with at least one qualifying treatment span. A qualifying span can be as short as 1 day of coverage, and an individual may have more than one span. For example, the population for calendar year 2018 will include all spans that began between (01/01/2018 − 180) and (12/31/2018 − 180). If an individual had any qualifying span of treatment beginning in this period, they are in the population. **Note:** Spans that began before the 180-day lookback period and continue into it are treated as if the 180-day lookback start date were the first day of the treatment span.
Operational Definition	1. Of population-compliant spans, identify those of 180 day or more. Total length in days is calculated as (Treatment End − Treatment Start + 1). All operational definition-compliant spans will have endpoints during the measurement period.

	Note: Spans that continue beyond the measurement period end date are treated as if measurement period end date is the end of the treatment span. 2. Count unique individual who had at least one treatment span lasting at least 180 days. This is the operational definition. For a visual representation of the operational definition, population, and lookback period, please see ***Appendix E***. **Community Attribution:** Identify HCS communities by location of residence. Use the most recent residence record from the population (12 months prior to measurement period, plus measurement period) to determine HCS community. **Note:** This measure allows for individuals to switch between MOUD types, provided that there is no more than a 7-day gap in continuous treatment.
Stratifications	For calendar year and evaluation period only. **Age:** 18–34, 35–54, 55–64 years, calculated as of last day of measurement period **Sex:** Male, female **Race/Ethnicity:** Hispanic, Non-Hispanic White, Non-Hispanic Black, Non-Hispanic Other, missing
Limitations	This measure will exclude individuals with an undiagnosed OUD and relies on MOUD reporting, including days' supply. This measure assumes that all MOUD prescriptions that are retainable are consumed only by the individual to whom they are prescribed. Kentucky's Medicaid program expanded coverage to include methadone for OUD treatment starting in July 2019.
Resources	Jones CM, Han B, Baldwin GT, Einstein EB, Compton WM. Use of Medication for Opioid Use Disorder Among Adults With Past-Year Opioid Use Disorder in the US, 2021. JAMA Netw Open. 2023 Aug 1;6(8):e2327488. https://doi.org/10.1001/jamanetworkopen.2023.27488 Wolters Kluwer. (2020). Medi-Span Electronic Drug File (MED-File) v2. National Quality Forum. (2019). Continuity of pharmacotherapy for opioid use disorder (OUD)–national quality strategy domain: effective clinical care–meaningful measure area: prevention and treatment of opioid and substance use disorders. https://qpp.cms.gov/docs/QPP_quality_measure_specifications/CQM-Measures/2019_Measure_468_MIPSCQM.pdf

M 2.7.5: Person-months in MOUD (Medicaid)

Measure Description	Total number of months that individuals enrolled in Medicaid aged 18-64 diagnosed with OUD within 12 months of the measurement period received medication for OUD.
Background	It is estimated that only 22% of adults in the U.S. with an OUD received MOUD in 2021 (Jones et al, 2023). Even fewer are believed to be retained in treatment for at least 180 days. Retention in treatment among individuals with OUD is used as a quality indicator of health care delivery systems (e.g., Healthcare Effectiveness Data and Information Set). MOUD is a component of best-practice treatment for OUD and may include one or more types of MOUD. Generally, increased amount of time in MOUD treatment is considered a positive outcome.
Data Sources	Administrative Medicaid claims data **Kentucky:** Kentucky Cabinet for Health and Family Services, Department for Medicaid Services **Massachusetts:** Massachusetts Executive Office of Health and Human Services **New York:** New York State Department of Health, Office of Health Insurance Programs **Ohio:** Ohio Department of Medicaid
Measurement Periods	Quarter, calendar year, and HCS evaluation period (July 1, 2021–June 30, 2022)
Population	In this measure, the OUD population is defined as any individual who had an OUD diagnosis for whom an ICD-10-CM Diagnosis Code of F11.1X or F11.2X (“opioid abuse” or “opioid dependence”) was used in the year prior to or during the measurement period. Individuals with an OUD diagnosis in the year prior to the measurement period contribute the full time in the measurement period to the population. Individuals who have their first OUD diagnosis during the measurement period contribute the remaining amount of time in the measurement period to the population. 1. Identify all Medicaid enrollees who were 18 to 64 years of age at any point during the measurement period and were not dual eligible (for Medicaid and Medicare) during the first month of the measurement period. 2. Of these, limit to individuals residing in HCS communities. If an individual resides in multiple communities throughout the measurement period, choose the most recent community during the measurement period. 3. Of these, limit to individuals with an OUD (ICD-10-CM Diagnosis Code of F11.1X or F11.2X) in any setting (inpatient, outpatient, or professional claims), in any position during the 12 months preceding or during the measurement period. (For the full list of ICD-10-CM

	Diagnosis Codes and descriptions, please see https://icd10cmtool.cdc.gov/?fy=FY2021.) 4. For individuals identified in steps 1 through 3, identify the first OUD diagnosis for whom an ICD-10-CM Diagnosis Code of F11.1X or F11.2X ("opioid abuse" or "opioid dependence") was used occurring in the 12 months preceding or during the measurement period, and all segments of continuous enrollment during the measurement period. Use the date of first OUD diagnosis and continuous enrollment to calculate the number of days each individual contributes to the population considering the following: Individuals with a first OUD diagnosis prior to or on the first day of the measurement period and with continuous enrollment for the entire measurement period contribute the full measurement period length to the population. Individuals with a first OUD diagnosis prior to or on the first day of the measurement period and with gaps in enrollment during the measurement period contribute the number of days for which they were enrolled during the measurement period to the population. Individuals with a first OUD diagnosis after the first day of the measurement period and with continuous enrollment for the entire measurement period contribute the number of days from the first OUD diagnosis through the end of the measurement period to the population. Individuals with a first OUD diagnosis after the first day of the measurement period and with gaps in enrollment during the measurement period contribute the number of days from the first OUD diagnosis through the end of the measurement period for which they were enrolled to the population. 5. Calculate the number of person-months in the population by summing all days contributed by individuals and dividing by 30.42. This is the population.
Operational Definition	This measure reports the total amount of time in MOUD (whether part of a continuous span or in noncontinuous periods) among individuals with OUD in relation to the potential amount of time they *could have been receiving* MOUD. 1. Of individuals in the population, identify claims for MOUD. This measure considers all modalities of methadone, naltrexone, and buprenorphine 2. Sort claims for each individual by date of service and construct spans of continuous treatment with MOUD, considering the following: Use National Drug Code (NDC) numbers for MOUD. (For a description of how NDCs were included in the measures, please see ***Appendix C***.)

	Use Healthcare Common Procedure Coding System (HCPCS) codes for MOUD. HCPCS codes may vary by state. States should use HCPCS codes and criteria that best reflect state policy and coding. For site-specific information on MOUD HCPCS codes, see ***Appendix D.*** An individual can have gaps in treatment of up to 7 days to be considered as having been in continuous treatment. A rolling surplus is accumulated for oral claims that occur on the same day or before the end of days covered by an earlier claim. No rolling surplus is accumulated for office administered or injectable MOUD claims that occur on the same day or before the end of days covered by an earlier claim. If a claim for injectable MOUD falls within an oral treatment span that has accumulated a rolling surplus, the surplus oral days are ignored; they cannot be applied to days following the injectable MOUD administration. 3. Among these, keep all spans and individual claims that encompass some part of the measurement period. 4. Calculate the total number of days during the measurement period in which the individual received MOUD. If the beginning or end of a treatment span extends beyond the measurement period, only count the days during the measurement period toward the operational definition. Only count MOUD coverage days that occur on or after the first OUD diagnosis. An individual can only have 1 day of MOUD coverage per calendar date, even if multiple claims covered the date. 5. Calculate the number of person-months on MOUD by summing all days that an individual received MOUD during the measurement period, and dividing by 30.42. This is the operational definition. **Community Attribution:** Identify HCS communities by location of residence. Use the most recent residence record from the population (12 months prior to measurement period, plus measurement period) to determine HCS community.
Stratifications	For calendar year and evaluation period only. **Age:** 18–34, 35–54, 55–64 years, calculated as of last day of measurement period **Sex:** Male, female **Race/Ethnicity:** Hispanic, Non-Hispanic White, Non-Hispanic Black, Non-Hispanic Other, missing
Limitations	This measure will exclude individuals with an undiagnosed OUD and relies on MOUD reporting, including days' supply. This measure assumes that all MOUD prescriptions that are retainable are consumed by the individual to whom they are prescribed.

Resources	Jones CM, Han B, Baldwin GT, Einstein EB, Compton WM. Use of Medication for Opioid Use Disorder Among Adults With Past-Year Opioid Use Disorder in the US, 2021. JAMA Netw Open. 2023 Aug 1;6(8):e2327488. https://doi.org/10.1001/jamanetworkopen.2023.27488 Wolters Kluwer. (2020). Medi-Span Electronic Drug File (MED-File) v2.

M 2.7.6: Number of individuals who received buprenorphine for treatment of OUD that are retained at least 180 days (Medicaid)

Measure Description	Number of individuals enrolled in Medicaid aged 18-64 diagnosed with opioid use disorder (OUD) within 12 months of the measurement period who received buprenorphine for the treatment of OUD for at least 180 days.
Background	It is estimated that only 22% of adults in the U.S. with an OUD received MOUD in 2021 (Jones et al, 2023). Even fewer are believed to be retained in treatment for at least 180 days. Retention in treatment among individuals with OUD is used as a quality indicator of health care delivery systems (e.g., Healthcare Effectiveness Data and Information Set). MOUD is a component of best-practice treatment for OUD and may include buprenorphine.
Data Sources	Administrative Medicaid claims data **Kentucky:** Kentucky Cabinet for Health and Family Services, Department for Medicaid Services **Massachusetts:** Massachusetts Executive Office of Health and Human Services **New York:** New York State Department of Health, Office of Health Insurance Programs **Ohio:** Ohio Department of Medicaid
Measurement Periods	Quarter, calendar year, and HCS evaluation period (July 1, 2021–June 30, 2022)
Population	1. Identify all Medicaid enrollees who were 18 to 64 years of age at any point during the measurement period and were not dual eligible (for Medicaid and Medicare) during the first month of the measurement period. 2. Of these, limit to individuals residing in HCS communities. If an individual resides in multiple communities throughout the measurement period, choose the most recent community during the measurement period. 3. Of these, limit to individuals with an OUD (ICD-10-CM Diagnosis Code of F11.1X or F11.2X) in any setting (inpatient, outpatient, or professional claims), in any position during the 12 months preceding or during the measurement period. (For the full list of ICD-10-CM

	Diagnosis Codes and descriptions, please see https://icd10cmtool.cdc.gov/?fy=FY2021.) 4. For individuals identified in steps 1 through 3, identify claims for FDA-approved buprenorphine formulations. Use National Drug Code (NDC) numbers for buprenorphine/naloxone. (For a description of how NDCs were included in the measures, please see ***Appendix C***.) Use Healthcare Common Procedure Coding System (HCPCS) codes for buprenorphine/naloxone. HCPCS codes may vary by state. States should use HCPCS codes and criteria that best reflect state policy and coding. 5. Sort claims for each individual by date of service and construct spans of continuous treatment with methadone, considering the following: An individual can have gaps in treatment of up to 7 days to be considered as having been in continuous treatment. Injectable claims contribute 28 days' supply unless another claim is found sooner or unless length is specified in claim or code documentation. A rolling surplus is accumulated for oral claims that occur on the same day or before the end of days covered by an earlier claim. No rolling surplus is accumulated for office administered or injectable claims that occur on the same day or before the end of days covered by an earlier claim. If a claim for injectable buprenorphine/naloxone falls within an oral treatment span that has accumulated a rolling surplus, the surplus oral days are ignored; they cannot be applied to days following the injectable administration. 6. Of continuous spans of treatment, limit to those that began between (Measurement Period Start − 180) and (Measurement Period End − 180) and for which the first date of treatment was followed by continuous enrollment in Medicaid for at least 180 days. 7. Count the number of individuals with at least one qualifying treatment span. A qualifying span can be as short as 1 day of coverage, and an individual may have more than one span. For example, the population for calendar year 2018 will include all spans that began between (01/01/2018 − 180) and (12/31/2018 − 180). If an individual had any qualifying span of treatment beginning in this period, they are in the population. **Note:** Spans that began before the 180-day lookback period and continue into it are treated as if the 180-day lookback start date were the first day of the treatment span.
Operational Definition	1. Of population-compliant spans, identify those of 180 day or more. Total length in days is calculated as (Treatment End − Treatment Start + 1).

	All numerator compliant spans will have endpoints during the measurement period. **Note:** Spans that continue beyond the measurement period end date are treated as if measurement period end date is the end of the treatment span. 2. Count unique individual who had at least one treatment span lasting at least 180 days. This is the numerator. For a visual representation of the operational definition, population, and lookback period, please see ***Appendix E***. **Community Attribution:** Identify HCS communities by location of residence. Use the most recent residence record from the population (12 months prior to measurement period, plus measurement period) to determine HCS community.
Stratifications	For calendar year and evaluation period only. **Age:** 18–34, 35–54, 55–64 years, calculated as of last day of measurement period **Sex:** Male, female **Race/Ethnicity:** Hispanic, Non-Hispanic White, Non-Hispanic Black, Non-Hispanic Other, missing
Limitations	This measure will exclude individuals with an undiagnosed OUD, and relies on MOUD reporting, including days' supply. This measure assumes that all MOUD prescriptions that are retainable are consumed by the individual to whom they are prescribed.
Resources	Jones CM, Han B, Baldwin GT, Einstein EB, Compton WM. Use of Medication for Opioid Use Disorder Among Adults With Past-Year Opioid Use Disorder in the US, 2021. JAMA Netw Open. 2023 Aug 1;6(8):e2327488. https://doi.org/10.1001/jamanetworkopen.2023.27488 Wolters Kluwer. (2020). Medi-Span Electronic Drug File (MED-File) v2. National Quality Forum. (2019). Continuity of pharmacotherapy for opioid use disorder (OUD)–national quality strategy domain: effective clinical care–meaningful measure area: prevention and treatment of opioid and substance use disorders. https://qpp.cms.gov/docs/QPP_quality_measure_specifications/CQM-Measures/2019_Measure_468_MIPSCQM.pdf

M 2.8.1: Number of emergency medical services events involving naloxone administration

Measure Description	Number of emergency medical services (EMS) encounters when naloxone was administered to individuals aged 18+.
Background	HCS collected EMS naloxone administration data as a near-real time proxy indicator for opioid overdose. Given the shorter lag in reporting time than

	opioid overdose deaths, this measure was used to monitor for adverse events and serious adverse events related to the study.
Data Sources	EMS run data **Kentucky:** Kentucky Board of Emergency Medical Services **Massachusetts:** Massachusetts Department of Public Health, Office of Population Health **New York:** New York State Department of Health, Data and Informatics Unit of the Division of Emergency Medical Systems **Ohio:** Ohio Department of Public Safety
Measurement Periods	Month, quarter, calendar year, and evaluation period (July 1, 2021–June 30, 2022)
Population	The population includes residents of HCS communities aged 18+. See Population Submeasure P.1.1 (18+) or P.2.1 (18+) for more details.
Operational Definition	Definitions are derived from elements from National Emergency Medical Services Information System (NEMSIS) v3.x and/or NEMSIS v2.x, which appear in ***bold italics***. Due to significant differences in data access, data quality, and local subject matter expertise, research sites measured similar construct for this measure. Site-specific definitions are presented here. **Kentucky** EMS encounters typically contain transfers and other non-emergent responses. Cases are limited to the following emergency response type only: ***[Response Type Of Service Requested (eResponse.05) = "911 Response (Scene)"]***. EMS data typically have higher completeness of incident location compared to resident location. ***[Incident County (eScene.21)]*** is used for county aggregate calculations to respective HCS community. Date of incident should be extracted from date-time fields. Because of completeness, ***[Incident Unit Notified By Dispatch Date Time (eTimes.03)]*** is utilized for date of encounter. 1. Counts are aggregated into individual encounters with **any** indication of a naloxone administered. This is different than (1) the unique number of persons (in a given period, an individual may have multiple encounters) and (2) the number of unique administrations. For example, a person receiving naloxone on 5 different days in a month would be counted five times, and a person receiving three doses during one encounter would be counted once. 2. This measure scans the following three fields for mentions of naloxone: ***[Medication Given Description (eMedications.03)]*** – Identify any mention of "Narcan|naloxone"

[Situation Complaint Statement (eSituation.04)] – Identify any mention of "Narcan|naloxone"

[Patient Care Report Narrative (eNarrative.01)] – Identify any mention of "Narcan|naloxone"

A match in any of these fields indicates an encounter in which naloxone was involved.

Note: Review of records indicated that the completeness of ***Medication Given Description (eMedications.03)*** is not sufficient and two HCS sites determined that limiting to only this structured medication field would miss ~40% of encounters.

Note: Because this metric is intended for monitoring outbreaks (adverse event monitoring), rates might not be necessary. Controlling for population is not necessary when looking at recent pattern changes.

Massachusetts

Cases are limited to the following emergency response type: ***[Response Type Of Service Requested (eResponse.05, E02.04) = "911 Response (Scene)"], "Emergency Response (Primary Response Area)", "Emergency Response (Intercept)", or "Emergency Response (Mutual Aid)"]***.

EMS data typically have much higher completeness of incident location compared to resident location ***[Incident location (eScene.21, E08.13)]***.

Date of incident should be extracted from date-time fields. Because of completeness, ***[Incident Dispatch Notified Date Time (eTimes.02, E05.01)]*** is utilized for the date of encounter.

1. Counts are aggregated into individual encounters with **any** indication of a naloxone administered. This is different than (1) the unique number of individuals (in a given period, an individual may have multiple encounters) and (2) the number of unique administrations. For example, a person receiving naloxone on 5 different days in a month would be counted five times, and a person receiving three doses during one encounter would be counted once.
2. Review of records indicated that the completeness of ***Medication Given Description (eMedications.03, E18_03)*** is not sufficient and two separate HCS sites determined that limiting to only this structured medication field would miss ~40% of encounters.
3. Massachusetts: Search for the terms "naloxone" or "Narcan" (exclude cases of "no naloxone" or "No Narcan") in the following records:

   The patient narrative

   The medications administered to the patient by the responding EMS

   Prior aid (by anyone—lay people, other EMS, police, etc.)

Stage 1: Define EMS incidents.

4. Identify only EMS incidents meeting the following criteria:

   To include only emergency responses and exclude incidents between health facilities, identify only EMS incidents involving 911 calls.

   Remove transports for which chief complaint is “dialysis”

   Remove transports for which the incident state or incident county is not in Massachusetts.

5. This measure scans three fields for mentions of naloxone:

   For National Emergency Medical Services Information System (NEMSIS) v2:

   [Medication Given Description (D18.03)] – Identify any mention of “narcan|nalox”

   [Prior Aid (E09.01)] – Identify any mention of “narcan|nalox”

   [Patient Care Report Narrative (E13.01)] – Identify any mention of “narcan|nalox” and exclude cases of “no nalox|no narcan.”

   For NEMSIS v3:

   [Medication Given Description or Prior Aid (eMedications.03 – for medication search, eMedications.02-to determine prior aid yes/no)] – Identify any mention of “narcan|nalox.”

   [Patient Care Report Narrative (eNarrative.01)] – Identify any mention of “narcan|nalox” and exclude cases of “no nalox|no narcan.”

   Note: Massachusetts groups “Medications/Prior Aid” together in NEMSIS v3 because “Prior Aid” is a flag on top of “Medication” in NEMSIS v3, not a separate field like it is in NEMSIS v2. A match in any one of the three fields indicates an encounter where naloxone was involved and is classified as a positive case for this measure.

New York

Naloxone is often utilized in the event of opioid-related overdose by first responders. Tracking of EMS, opioid overdose–related encounters with naloxone administration as a proxy may be important to surveillance of opioid overdose morbidity. Additionally, naloxone administrations in the field may not result in hospitalization/ED visit and this measure may be important in monitoring the incidence of opioid overdoses in a community. Tracking naloxone encounters by EMS provides a proxy measure for naloxone use in communities.

1. Limit to EMS run encounters ***[Response Type of Service Requested (eResponse.05) = “911 Response (Scene)”]***.
2. Limit to appropriate period using event date-time field ***[Incident Dispatch Notified Date Time (eTimes.02)]***.

3. Limit to HCS county based on county of incident ***[Incident County (eScene.21)]***.
4. Remove records where the patient is younger than 18 years of age.
5. Limit to Administration of Naloxone. Medication Administered (eMedications.03) includes one of the following strings: “Narcan” or “Naloxone”
6. The count of records that are in scope and that have naloxone distributed within each community would be the numerator for M 2.8.1.

   Limits on New York State ePCR data:

   ePCR data submitted for dates of service in 2017, 2018, and Q3 2019 were primarily documented in NEMSIS v2.2.1 with diminished data quality and completeness. Most of the agencies made the transition to the NEMSIS v3.4.0 in Q4 2019. The expectation is that all electronic documenting EMS agencies will be transitioned to NEMSIS v3.4.0 by the end of Q1 2020. EMS agencies that are reporting via paper will continue to be transitioned but could continue to report via paper beyond the scope of this study.

   EMS agencies began transitioning from NEMSIS v2.2.1 to NEMSIS v3.4.0 (with a higher quality and completeness of data) in 2016 and had completed by March 30, 2020.

Ohio

Cases are limited to the following emergency response type: ***[Response Type Of Service Requested (eResponse.05) = “911 Response (Scene)”]***.

EMS data typically has much higher completeness of incident location compared to resident location. ***[Incident County (eScene.21)]*** is used for county aggregate calculations.

Date of incident should be extracted from date-time fields. Because of completeness, ***[Incident Dispatch Notified Date Time (eTimes.03)]*** is utilized for date of encounter.

1. Counts are aggregated into individual encounters with *any* indication of a naloxone administered. This is different than (1) the unique number of persons (in a given period, an individual may have multiple encounters) and (2) the number of unique administrations. For example, a person receiving naloxone on 5 different days in a month would be counted five times, and a person receiving three doses during one encounter would be counted once.
2. This measure scans the following two fields for mentions of naloxone:

   [Medication Given Description (eMedications.03)] – Identify any mention of “narcan|naloxone”

   [Situation Complaint Statement (eSituation.04)] – Identify any mention of “narcan|naloxone”

	A match in any one of the two fields indicates an encounter where naloxone was involved and is classified as a positive case for this measure. **Notes:** Because this metric is intended for monitoring outbreaks (adverse event monitoring), rates might not be necessary. Controlling for population is not necessary when looking at recent pattern changes in administration. Review of records indicated that the completeness of Medication Given Description (eMedications.03) is not sufficient and two HCS sites determined that limiting to only this structured medication field would miss ~40% of encounters.
Stratifications	For calendar year and evaluation period only. **Age:** 18–34, 35–54, 55+ years, missing **Sex:** Male, female, missing **Race/Ethnicity:** Hispanic, Non-Hispanic White, Non-Hispanic Black, Non-Hispanic Other, missing
Limitations	New York has race/ethnicity data for 2021 and later.

M 2.8.2: Number of emergency medical services events with suspected opioid overdose

Measure Description	Number of emergency medical services (EMS) encounters when naloxone was administered to individuals with a suspected opioid overdose.
Background	HCS collected EMS naloxone administration data for all suspected opioid overdose EMS encounters as a near real-time proxy indicator for opioid overdose.
Data Sources	EMS run data **Kentucky:** Kentucky Board of Emergency Medical Services **Massachusetts:** Massachusetts Department of Public Health, Office of Population Health **New York:** New York State Department of Health, Data and Informatics Unit of the Division of Emergency Medical Systems **Ohio:** Ohio Department of Public Safety
Measurement Periods	Month, quarter, calendar year, and evaluation period (July 1, 2021–June 30, 2022)
Population	**Kentucky** KY used Population Submeasure P.1 (all ages) to calculate this measure's population. Please see the Population Measures section for details on calculation.

	Massachusetts MA used Population Submeasure P.2 (all ages) to calculate this measure's population. Please see the Population Measures section for details on calculation.
	New York The NY population includes residents of HCS communities aged 18+. See Population Submeasure P.1.1 (18+) or P.2.1 (18+) for more details.
	Ohio OH used Population Submeasure P.1 (all ages) to calculate this measure's population. Please see the Population Measures section for details on calculation.
Operational Definition	Definitions are derived from elements from National Emergency Medical Services Information System (NEMSIS) v3.x and/or NEMSIS v2.x, which will appear in ***bold italics***. The implementation and interpretation of the measure varies by research site due to variation in the access to different data elements in the EMS records. Site-specific definitions are presented. **Kentucky** "All EMS encounters" is typically too broad and may contain transfers and other non-emergent responses; therefore, cases are limited to the following emergency response type: ***[Response Type Of Service Requested (eResponse.05) = "911 Response (Scene)"]***. EMS data typically have much higher completeness of incident location compared to resident location. ***[Incident County (eScene.21)]*** is used for county aggregate calculations. Date of incident should be extracted from date-time fields. Because of completeness, ***[Incident Unit Notified By Dispatch Date Time (eTimes.03)]*** is utilized for date of encounter. Counts are aggregated into **unique encounters of suspected opioid involved overdoses**. This is different than the unique number of persons (e.g., in a given period, an individual may have multiple encounters). The measure is classified as a positive case if the fields and combined criteria listed in the following rows are indicated for a unique encounter. See Kentucky Classification Rules table for details.
	Massachusetts Cases are limited to the following emergency response type: ***[Response Type Of Service Requested (eResponse.05, E02.04) = "911 Response (Scene)"], "Emergency Response (Primary Response Area)", "Emergency Response (Intercept)", or "Emergency Response (Mutual Aid)"]***. EMS data typically have much higher completeness of incident location compared to resident location ***[Incident location (eScene.21, E08.13)]***.

Date of incident should be extracted from date-time fields. Because of completeness, ***[Incident Dispatch Notified Date Time (eTimes.02, E05.01)]*** is utilized for the date of encounter

Counts are aggregated into unique encounters of suspected opioid involved overdoses. This is different than the unique number of persons (e.g., in a given period, an individual may have multiple encounters). The measure is classified as a positive case if the fields and combined criteria listed in the following rows are indicated for a unique encounter. See Massachusetts Classification Rules section for details for both NEMSIS v2.x and v3.x data.

New York

Number of HCS community resident EMS naloxone administrations

1. Start with the records that define the counts reported for measure M 2.8.1.
2. Records should be retained if any one of the following conditions is met:

   Medication Response (***eMedications.07***) is “improved” following the administration of naloxone or Narcan.

   Primary Impression (***eSituation.11***) includes any one of the following: F11, T40.0–T40.4, T40.

   Secondary Impression (***eStuations.12***) includes one of the following: opioid, heroin
3. The number of records that meet the conditions of M 2.8.1 AND that meet one of the three record retention conditions is the numerator for M 2.8.2.

   Limits on New York ePCR data:

   ePCR data submitted for dates of service in 2017, 2018, and Q3 2019 were primarily documented in NEMSIS v2.2.1 with diminished data quality and completeness. Most of the agencies made the transition to the NEMSIS v3.4.0 in Q4 2019. The expectation is that all electronic documenting EMS agencies will be transitioned to NEMSIS v3.4.0 by the end of Q1 2020. EMS agencies that report via paper will continue to be transitioned but may continue to report via paper beyond the scope of this study.

   EMS agencies began transitioning from NEMSIS v2.2.1 to NEMSIS v3.4.0 (with a higher quality and completeness of data) in 2016 and had completed by March 30, 2020.

	Ohio All EMS encounters are typically too broad and can contain transfers and other non-emergent responses. Cases are limited to the following emergency response type: ***[Response Type Of Service Requested (eResponse.05) = "911 Response (Scene)"]***. EMS data typically have much higher completeness of incident location compared to resident location. ***[Incident County (eScene.21)]*** is used for county aggregate calculations. Date of incident should be extracted from date-time fields. Because of completeness, ***[Incident Dispatch Notified Date Time (eTimes.03)]*** is utilized for date of encounter. Counts are aggregated into unique encounters of suspected opioid involved overdoses. This is different than the unique number of persons (e.g., in a given period, an individual may have multiple encounters). The measure is classified as a positive case if the following fields and combined criteria listed below are indicated for a unique encounter. See Ohio Classification Rules table for details.
Stratifications	For calendar year and evaluation period only. **Age:** 18–34, 35–54, 55+ years, missing **Sex:** Male, female, missing **Race/Ethnicity:** Hispanic, Non-Hispanic White, Non-Hispanic Black, Non-Hispanic Other, missing
Limitations	Due to differences between the 4 states in data access, data quality, and local subject matter expertise, individual research sites have implemented their own technical specification for this EMS measures. The implemented measures are *similar* but not the same and thus should not be used for comparison across different research sites. The measure is designed to allow monitoring within a specific community over time, to allow for early alert notification in case of detecting unusually high monthly counts. Due to differences in the technical specification of the implemented conceptual measure, the counts captured by measure 2.8.2 should be interpreted in the following way: ○ For KY, NY, OH: number of EMS encounters for suspected opioid overdose ○ For MA: number of EMS encounters for suspected opioid-related incidents (Note: broader than opioid overdoses) The EMS records do not include a diagnosis and therefore we include the word "suspected" in the definition title.

Kentucky Classification Rules

Criteria	Field Name	Matched Criteria
A	eSituation.11 Provider's Primary Impression OR eSituation.12 Provider's Secondary Impression	Opioid-related disorders (F11) | Opioid abuse with intoxication, uncomplicate (F11.120) | Overdose by opioids, accidental (unintentional) (T40.2X1) | Overdose by heroin, undetermined (T40.1X4)
B	eNarrative.01 Patient Care Report Narrative OR eSituation.04 Complaint	opioid | opiate | opium | fentanyl | heroin | speedball | speed ball | spheroin | hod
C	eMedications.03 Medication Administered OR eNarrative.01 Patient Care Report Narrative OR eSituation.04 Complaint	Narcan | Naloxone
D	eMedications.03 Medication Administered WITH eMedications.07 Response to Medication	Medication: Narcan | Naloxone WITH Response: improved

Measure classified as *opioid overdose* if **any one of the following six criteria are a positive match:**

A and **B** and **C**

A and **B**

A and **C**

B and **C**

D

C and **Any drug overdose definition** (see Any Drug Overdose Definition Fields: Kentucky table that follows.)

Any Drug Overdose Definition Fields: Kentucky (to be used in Criteria 6 of opioid definition criteria)

Criteria	Field Name	Matched Criteria
A	eSituation.11 Provider's Primary Impression OR eSituation.12 Provider's Secondary Impression	ICD-10-CM Diagnosis Codes of F15 | F11 | F11.120 | F16 | F14 | F13 | F18 | F19 | F19.10 | T40.2X1 | T43.291 | T40.1X4 | T50.991 | T40.691 | T50.904
B	eNarrative.01 Patient Care Report Narrative OR eSituation.04 Complaint	Overdose | opioid | opiate | opium | fentanyl | heroin | speedball | speed ball | spheroin | OD | O.D. | O/D | OD/ | ODED | hod
C	eMedications.03 Medication Administered OR eNarrative.01 Patient Care Report Narrative OR eSituation.04 Complaint	Medication: Narcan | Naloxone
D	eMedications.03 Medication Administered WITH eMedications.07 Response to Medication	Medication: Narcan | Naloxone WITH Response: improved
E	eMedications.03 Medication Administered WITH eMedications.07 Response to Medication WITH [eNarrative.01 Patient Care Report Narrative OR eSituation.04 Complaint]	Medication: Narcan | Naloxone WITH Response not equal: Unchanged | Worse AND [Narrative OR Complaint contains: white powder | syringes | drug paraphernalia | more responsive | began breathing | more alert | loc improved | improved loc | improvement in loc | positive response to narcan

Measure classified as “any drug” overdose if **any one of the following six criteria are a positive match:**

A and **B** and **C**
A and **B**
A and **C**
B and **C**
D
E

Massachusetts Classification Rules

Massachusetts receives both National Emergency Medical Services Information System (NEMSIS) v2.x and NEMSIS v3.x and has historic, version-specific definitions applied to each. The following sections are Massachusetts’ v2.x and Massachusetts’ v3.x, respectively identified.

Massachusetts’ NEMSIS Version 2.x Classification Rules

Suspected EMS opioid-related incidents (ORIs) were identified using the following three-stage process:

Stage 1: Subset EMS incidents for classification.

Only EMS incidents meeting the following criteria were included in the analysis:

Include only emergency responses and exclude interfacility transports.

Exclude transports where chief complaint is “dialysis.”

Exclude transports where the incident state or incident county is not in Massachusetts.

Stage 2: Define EMS incidents that are not suspected ORIs.

To reduce false positive, an EMS incident was not classified as an ORI if it met any of the following criteria:

Do not classify as an ORI when the EMS transport is not related to an emergency but involves transporting a patient or a Section 12. (**Note:** These transports are listed incorrectly as 911 responses.)

- “section 12,” “sect 12,” or “sec 12” (narrative, chief complaint, secondary complaint, other complaint)
- “transport only” (chief complaint, secondary complaint, other complaint)

Do not classify as an ORI when EMS incident is primarily related to a traffic issue/crash.

- “traffic” (chief complaint, secondary complaint, other complaint)

Do not classify as an ORI when the EMS incident is responding to a suspected alcohol overdose.

- The words “poison” occurs AND either of the following two words are present: “Alcohol” and “etoh” (chief complaint, secondary complaint, other complaint).

Do not classify as an ORI if EMS administered fentanyl unless the incident meets Inclusion Criteria 3 or 4 (see table below).

Stage 3: Prioritize criteria.

Criteria indicates which criteria is run first (i.e., cases are selected based on Criteria 1 and then cases not selected are examined using Criteria 2).

Case Definition for Massachusetts Emergency Medical Services (EMS) Analysis (Massachusetts Ambulance Trip Record Information System) - National Emergency Medical Services Information System (NEMSIS) Version 2.x

EMS Variable	Suspected Opioid-Related Incident (ORI) – More Refined, May Differ by Service
Chief Complaint (CC) [E09.05]	Criteria 1: Heroin, Herion, Opio, Opiat, Narcan, Nalox, Methadone, Opoid, Fentanyl, Phentanyl, or Fentynal
Secondary Complaint [E09.08]	Criteria 2: Heroin, Herion, Opio, Opiat, Narcan, Nalox, Methadone, Opoid, Fentanyl, Phentanyl, or Fentynal
Narrative Report (NR) [E13.01]	Criteria 3: Must find one word from each list: • List1: Heroin, Herion • List2: Overdos, OD, O.D, O/D, Drug intox, over dos Criteria 9: Must find one word from List1, one word from List2, and no word from List3: • List1: Heroin, Herion • List2: inject, snort, sniff, ingest, took, consum, shot, shoot, smok, swallow, intranasal, done, doing, abusing, using, used • List3: deny, denies, denied **Note:** List3 is overridden if the patient had a positive response to naloxone (i.e., if a person would not be excluded if they denied use but had a positive response to naloxone). Criteria 10: Must find one word from each list: • List1: Heroin, Herion • List2: needle, syringe, hypodermic, paraphernalia Criteria 11: Must find one word from List1, one word from List2, and no word from List3: • List1: Heroin, Herion • List2: today, recent • List3: deny, denies, denied **Note:** List3 is overridden if the patient had a positive response to naloxone (i.e., if a person would not be excluded if they denied use but had a positive response to naloxone) Criteria 14: Must find one word from each list: • List1: Heroin, Herion • List2: admit, admission

	Criteria 15: Must find one word from each list: • List1: known ivda, known ivdu • List2: needle, syringe, hypodermic, paraphernalia Criteria 16: Must find one word from each list: • List1: rigor, lividity, pulseless, nonviable • List2: syringe, hypodermic, paraphernalia • List3: heroin, Herion, Overdos, OD, O.D, O/D, Over dos, Drug Intox
Administered Naloxone* + NR [D04.06, E13.01, E09.01] + [E13.01]	Criteria 4: Two conditions must be met: Naloxone administered* AND NR contains: heroin, herion, Overdos, OD, O.D, O/D, Over dos, Drug Intox Criteria 12: Two conditions must be met: Naloxone administered* AND NR contains: methadone, methodone, opio, herion, opoid, subox, sabox, fentanyl, phentanyl, fentynal, vicod, oxycod, oxycont, oxys, ms04, Percocet, percoset, hydromorph, pain meds, tramadol, codeine, dialaudid, dilaudid, morphine, speedball, speed ball * Naloxone administration is counted if any of the following three fields indicate naloxone: Medication administered field Prior aid field NR contains: Narcan, Nalox
NR + CC [E13.01] + [E09.05]	Criteria 5: Two conditions must be met: NR contains: Heroin, Herion AND CC contains: alter, ams, overdose, over dose, drug abuse, drug use, drug ingestion, od, o.d, substance use, substance abuse, sick person, unresponsive, unconscious, man down, ingestion/overdose, breathing problem, confusion, respiratory distress, respiratory arrest, iv drug, needle Criteria 8: Two conditions must be met: NR contains: methadone, methodone, opio, herion, subox, sabox, fentanyl, phentanyl, fentynal, vicod, oxycod, oxycont, oxys, ms04, Percocet, percoset, hydromorph, pain meds,

	tramadol, codeine, dialaudid, dilaudid, morphine, speedball, speed ball AND CC or NR contains: Overdos, OD, O.D, O/D, Over dos Criteria 17: Two conditions must be met: NR contains: needle, syringe, hypodermic, paraphernalia AND CC contains: Overdos, OD, O.D, O/D, Over dos
Response to Naloxone + CC [D18.03, E18.07] + [E09.05]	Criteria 6: Two conditions must be met: Positive response to Naloxone was indicated AND CC contains: alter, ams, overdose, over dose, od, o/d, o.d, aloc, change in mental, unresponsive, unconscious, change in mental, change in responsiveness
NR+ Primary Impression (PI) [E13.01] + [E09.15]	Criteria 13: Two conditions must be met: NR contains: methadone, methodone, opio, herion, subox, sabox, fentanyl, phentanyl, fentynal, vicod, oxycod, oxycont, oxys, ms04, Percocet, percoset, hydromorph, pain meds, tramadol, codeine, dialaudid, dilaudid, morphine, speedball, speed ball AND PI = overdose/drug ingestion
NR + PI + CC [E13.01] + [E09.15] + [E09.05]	Criteria 7: Two conditions must be met: NR contains: Narcan, Nalox AND CC contains: Overdos, OD, O.D, O/D, Over dos OR PI = overdose/drug ingestion, obvious signs of death, or substance/drug abuse Criteria 18: Two conditions must be met: NR or CC or PI contains: cardiac, respiratory, cardioresp, arrest AND NR contains: syringe, hypodermic, paraphernalia

Massachusetts' National Emergency Medical Services Information System (NEMSIS) Version 3.x Classification Rules

Suspected emergency medical services (EMS) opioid-related incidents (ORIs) were identified using the following three-stage process:

Initial inclusion exclusion are the same as Massachusetts' NEMSIS Version 2.x above (Stage 1 and Stage 2)

Ohio Classification Rules

Criteria	Field Name	Matched Criteria
A	eSituation.11 Provider's Primary Impression	ICD-10-CM Diagnosis Codes of Opioid-related disorders (F11) |Opioid abuse with intoxication, uncomplicate (F11.120) |Overdose by opioids, accidental (unintentional) (T40.2X1) | Overdose by heroin, undetermined (T40.1X4)
B	eSituation.12 Provider's Secondary Impression	Opioid | Heroin
C	eSituation.04 Complaint	opioid | opiate | opium | fentanyl | heroin | speedball | speed ball | spheroin | hod
D	eMedications.03 Medication Administered OR Situation.04 Complaint	Medication: Narcan | Naloxone OR Complaint: Narcan | Naloxone
E	eMedications.03 Medication Administered WITH eMedications.07 Response to Medication	Medication: Narcan | Naloxone WITH Response: improved

This measure is classified as opioid overdose if any one of the following six criteria is met:

Positive match for

1. (A or B) & C & D
2. (A or B) & C
3. (A or B) & D
4. C & D
5. E
6. D & "Any drug overdose definition" (see Any Drug Overdose Definition Fields: Ohio table that follows)

Any Drug Overdose Definition Fields: Ohio (to be used in Criteria 6 of Opioid Definition Criteria)

Criteria	Field Name	Matched Criteria
A	eSituation.11 Provider's Primary Impression	ICD-10-CM Diagnostic Codes of F15 | F11 | F11.120 | F16 | F14 | F13 | F18 | F19 | F19.10 | T40.2X1 | T43.291 | T40.1X4 | T50.991 | T40.691 | T50.904
B	eSituation.12 Provider's Secondary Impression	Opioid | Simulant | Hallucinogen | Cocaine | Sedative | Inhalant | Psychoactive| Heroin | Other drugs | Unspecified drugs
C	eSituation.04 Complaint	Overdose | opioid | opiate | opium | fentanyl | heroin | speedball | speed ball | spheroin | OD | O.D. | O/D | OD/ | ODED | hod
D	eMedications.03 Medication Administered OR eSituation.04 Complaint	Medication: Narcan | Naloxone OR Complaint: Narcan | Naloxone
E	eMedications.03 Medication Administered WITH eMedications.07 Response to Medication	Medication: Narcan | Naloxone WITH Response: improved
F	eMedications.03 Medication Administered WITH eMedications.07 Response to Medication WITH eSituation.04 Complaint	Medication: Narcan | Naloxone WITH Response not equal: Unchanged | Worse AND Complaint contains: white powder | syringes | drug paraphernalia | more responsive | began breathing | more alert | loc improved | improved loc | improvement in loc | positive response to narcan

Measure classified as “any drug” overdose if **any one of the following six criteria are a positive match:**

1. (A or B) & C & D
2. (A or B) & C
3. (A or B) & D
4. C & D
5. E
6. F

M 2.9.1: Number of individuals linked to MOUD following opioid overdose (Medicaid)

Measure Description	Number of individuals enrolled in Medicaid aged 18-64 who had an opioid overdose diagnosis treated in the emergency department (ED) or inpatient setting during the measurement period and received a medication for OUD within 31 days of the initial date of service.
Background	Linking individuals to MOUD following a nonfatal opioid overdose is associated with reduced opioid overdose mortality.
Data Sources	Administrative Medicaid claims data **Kentucky:** Kentucky Cabinet for Health and Family Services, Department for Medicaid Services **Massachusetts:** Massachusetts Executive Office of Health and Human Services **New York:** New York State Department of Health, Office of Health Insurance Programs **Ohio:** Ohio Department of Medicaid
Measurement Periods	Quarter, calendar year, and evaluation period (July 1, 2021–June 30, 2022)
Population	Methodology for identifying opioid overdoses is from the Council of State and Territorial Epidemiologists' ICD-10-CM Injury Surveillance Toolkit. (For ICD-10-CM Diagnosis Codes, Procedure Codes, and descriptions, please see https://icd10cmtool.cdc.gov/?fy=FY2021.) 1. Identify all Medicaid enrollees who were 18 to 64 years of age at any point during the measurement period and who were not dual eligible (for Medicaid and Medicare) during the first month of the measurement period. 2. Identify those residing in HCS communities with community of residence. If an individual resides in multiple communities throughout the measurement period, choose the most recent residence during the measurement period. 3. Keep those that had a visit in the ED or inpatient setting for an opioid overdose during the measurement period. If an individual had multiple overdoses during the measurement period, each overdose event is retained. 4. Identify opioid overdose visits with any mention of ICD-10-CM Diagnosis Codes (in any position) of T40.0X–T40.4X T40.60 T40.69 AND

	a 6th character of 1: Accidental (unintentional) 2: Intentional self-harm 3: Assault 4: Undetermined intent AND a 7th (last) character of A OR missing 5. Count the number of unique individuals per HCS community that had at least one nonfatal opioid overdose during the measurement period. An individual may be counted in the population only once, though multiple opioid-related visits may be observed and considered for inclusion in the operational definition. This is the population.
Operational Definition	Methodology for identifying opioid overdoses is from the Council of State and Territorial Epidemiologists' ICD-10-CM Injury Surveillance Toolkit. (For ICD-10-CM Diagnosis Codes, Procedure Codes, and descriptions, please see https://icd10cmtool.cdc.gov/?fy=FY2021.) 1. For each opioid overdose in the population, identify those that had at least one claim for naltrexone, methadone maintenance treatment, or buprenorphine in 31 days following the initial date of service for the opioid overdose. Note that the MOUD does not have to occur during the measurement period, but must occur during the 31 days following the opioid overdose event. MOUD claims on the same date as the event should be included in the 31 days. 2. Use National Drug Code (NDC) numbers for MOUD. (For a description of how NDCs were included in the measures, please see ***Appendix C***.) 3. Use Healthcare Common Procedure Coding System (HCPCS) codes for MOUD. HCPCS codes may vary by state. States should use HCPCS codes and criteria that best reflect state policy and coding. For site-specific information on MOUD HCPCS codes, see ***Appendix D.*** 4. Count the number of individuals who had an MOUD claim in the 31 days following an opioid overdose event. If an individual had multiple opioid overdose events in the measurement period, and at least one event met the measure criteria, the individual is in the operational definition. An individual may count only once toward the measure. **Programming Note: Any Opioid Overdose (Full Regular Expression) ((T40[0-4].|T406[09])[1-4])(A|$|\b)** **Note:** This measure does not require continuous enrollment during the measurement period.

	Note: in this measure, an individual who has multiple opioid overdoses in a measurement period has multiple "chances" to be successfully linked to MOUD but may be counted only once in the operational definition and once in the population. **Community Attribution:** Identify HCS communities by location of residence. Use the most recent residence record from the population to determine HCS community.
Stratifications	For calendar year and evaluation period only. **Age:** 18–34, 35–54, 55–64 years, calculated as of last day of measurement period **Sex:** Male, female **Race/Ethnicity:** Hispanic, Non-Hispanic White, Non-Hispanic Black, Non-Hispanic Other, missing
Limitations	This measure is limited to individuals enrolled in Medicaid claims, and the operational definition is limited to individuals who had an ED or inpatient encounter for an opioid overdose for which Medicaid was the primary payer. ED or inpatient encounters for opioid overdoses for which Medicaid was not the primary payer will be missed as will opioid overdoses not treated in these settings. Additionally, individuals who receive MOUD in a setting where Medicaid is not the primary payer will be excluded from the operational definition. Indication of live discharge and/or death following a population event are not determinable in all states. Therefore, the population may include events where an individual died on the event date or during the 31 day follow up period. MOUD administered in ED or inpatient setting is not captured in Medicaid claims data. As this measure assigns enrollees to HCS community based on community of residence, individuals who have an opioid overdose treated in the HCS community but reside elsewhere will not be included in analysis.

M 2.9.2: Number of opioid overdoses in which the individual was connected to MOUD within 31 days (Medicaid)

Measure Description	Number of opioid overdose diagnoses in the emergency department (ED) or inpatient setting during the measurement period among individuals enrolled in Medicaid aged 18-64 where the individual received a medication for OUD within 31 days of the initial date of service.
Background	Linking individuals with MOUD following a nonfatal opioid overdose is associated with reduced opioid overdose mortality.
Data Sources	Administrative Medicaid claims data **Kentucky:** Kentucky Cabinet for Health and Family Services, Department for Medicaid Services

	Massachusetts: Massachusetts Executive Office of Health and Human Services **New York:** New York State Department of Health, Office of Health Insurance Programs **Ohio:** Ohio Department of Medicaid
Measurement Periods	Quarter, calendar year, and HCS evaluation period (July 1, 2021–June 30, 2022)
Population	Methodology for identifying opioid overdoses is from the Council of State and Territorial Epidemiologists' ICD-10-CM Injury Surveillance Toolkit. (For ICD-10-CM Diagnosis Codes, Procedure Codes, and descriptions, please see https://icd10cmtool.cdc.gov/?fy=FY2021.) 1. Identify all individuals who were 18 to 64 years of age at any point during the measurement period and who were not dual eligible (for Medicaid and Medicare) during the first month of the measurement period. 2. Identify those residing in HCS communities with community of residence. If an individual resides in multiple counties throughout the measurement period, choose the most recent community of residence during the measurement period. 3. For the group of individuals in step 2, select all ED or inpatient visits for individuals with an opioid overdose diagnosis. If an individual had multiple overdoses during the measurement period, retain each one. 4. Identify opioid overdose visits with ICD-10-CM Diagnosis Codes (in any position) of T40.0X–T40.4X T40.60 T40.69 AND a 6th character of 1: Accidental (unintentional) 2: Intentional self-harm 3: Assault 4: Undetermined intent AND a 7th character of A OR missing 5. Count the number of unique opioid overdose events during the measurement period. An individual can only have one event per date of

	service (a unique event is defined as a unique date of service and enrollee ID). Note that in this measure, an individual with multiple qualifying events during the measurement period counts multiple times toward the population (i.e., the unit is the event). The count of events is the population.
Operational Definition	Methodology for identifying opioid overdoses is from the Council of State and Territorial Epidemiologists' ICD-10-CM Injury Surveillance Toolkit. (For ICD-10-CM Diagnosis Codes, Procedure Codes, and descriptions, please see https://icd10cmtool.cdc.gov/?fy=FY2021.) 1. For each opioid overdose event in the population, identify those that had at least one claim for naltrexone, methadone maintenance treatment, or buprenorphine in the 31 days following the initial date of service for the ED or inpatient visit. Note that the MOUD does not have to occur during the measurement period, but must occur in the 31 days following the ED event. MOUD claims on the same date as the event should be included within the 31 days. 2. Use National Drug Code (NDC) numbers to identify oral prescription MOUD (buprenorphine products, naltrexone). (For a description of how NDCs were included in the measures, please see ***Appendix C***.) 3. Use Healthcare Common Procedure Coding System (HCPCS) codes to identify office-administered MOUD (i.e., methadone, buprenorphine products, naltrexone). HCPCS codes may vary by state. States should use HCPCS codes and criteria that best reflect state policy and coding. For site-specific information on MOUD HCPCS codes, see ***Appendix D.*** 4. Count the number of opioid overdoses in which the individual had at least one claim for MOUD claim in the 31 days following the opioid overdose event inclusive of the date of the event. An individual may count toward the operational definition more than once if they had multiple opioid overdose events during the measurement period that met the operational definition criteria. **Programming Note:** Any Opioid Overdose (Full Regular Expression) ((T40[0-4].|T406[09])[1-4])(A|$|\b) **Note**: This measure does not require continuous enrollment during the measurement period. **Note:** in this measure, an individual who has multiple ED or inpatient visits for opioid overdose in a measurement period is eligible to be linked to MOUD with each visit. Thus, the population and operational definition reflect the total number of opioid overdose events in the measurement period. **Community Attribution:** Identify HCS communities by location of residence. Use the most recent residence record from the population to determine HCS community.
Stratifications	For calendar year and evaluation period only.

	Age: 18–34, 35–54, 55–64 years, calculated as of last day of measurement period **Sex:** Male, female **Race/Ethnicity:** Hispanic, Non-Hispanic White, Non-Hispanic Black, Non-Hispanic Other, missing
Limitations	An individual with an opioid overdose is assessed for MOUD receipt in the 31 days following the opioid overdose. During this period, they may have another opioid overdose and begin another 31-day follow-up period, some of which may overlap with the previous follow-up period. If they have an MOUD claim during this overlap, they will be complaint for the operational definition twice, even though they had only one MOUD claim. This could lead to an over count of MOUD following opioid overdoses, which is the main objective of this measure. This measure is limited to individuals who are enrolled in Medicaid. Further, the operational definition is limited to individuals who had an ED or inpatient encounter for an opioid overdose for which Medicaid was the primary payer. ED or inpatient encounters for opioid overdoses for which Medicaid was not the primary payer will be missed as will opioid overdoses not treated in these settings. Additionally, individuals who receive MOUD in a setting where Medicaid is not the primary payer will be excluded from the operational definition. Indication of live discharge and/or death following a population event are not determinable in all states. Therefore, the population may include events where an individual died on the event date or during the 31 day follow up period. MOUD administered in ED or inpatient setting is not captured in Medicaid claims data. As this measure assigns enrollees to HCS community based on community of residence, individuals who have an opioid overdose treated in the HCS community but reside elsewhere will not be included in analysis.

M 2.12.1: Number of individuals linked to MOUD following opioid-related emergency department visit (Medicaid)

Measure Description	Number of individuals enrolled in Medicaid aged 18-64 who had an opioid-related emergency department (ED) visit during the measurement period and received a medication for OUD within 31 days of the initial date of service.
Background	Linking individuals to MOUD following an opioid-related ED visit is associated with reduced opioid overdose mortality. An individual presenting at the ED with an opioid-related condition may be at higher risk of an opioid overdose later and connecting to MOUD is a priority for preventing adverse outcomes.
Data Sources	Administrative Medicaid claims data **Kentucky:** Kentucky Cabinet for Health and Family Services, Department for Medicaid Services

	Massachusetts: Massachusetts Executive Office of Health and Human Services **New York:** New York State Department of Health, Office of Health Insurance Programs **Ohio:** Ohio Department of Medicaid
Measurement Periods	Quarter, calendar year, and HCS evaluation period (July 1, 2021–June 30, 2022)
Population	Methodology for identifying opioid overdoses is from the Council of State and Territorial Epidemiologists' ICD-10-CM Injury Surveillance Toolkit. (For ICD-10-CM Diagnosis Codes, Procedure Codes, and descriptions, please see https://icd10cmtool.cdc.gov/?fy=FY2021.) 1. Identify all individuals who were 18 to 64 years of age at any point during the measurement period and were not dual eligible (for Medicaid and Medicare) during the first month of the measurement period. 2. Identify those residing in HCS communities using the address of residence. If an individual resides in multiple HCS communities throughout the measurement period, choose the most recent community of residence during the measurement period. 3. Identify all ED visits. For those individuals identified in step 2, select all ED visits that occur during the measurement period. If an individual had multiple ED visits during the measurement period, each the visit is retained. Identify ED claims with Current Procedural Terminology/Healthcare Common Procedure Coding System (CPT/HCPCS) codes of 99281–99285 G0380–G0384 OR Revenue Codes of 0450–0452 0456 0459 0981 OR Place of Service Code of 23 4. Limit to opioid-related ED visits. Of ED visits discovered in step 3, identify and retain only the opioid-related visits that include ICD-10-CM Diagnosis Codes (in any position) of T40.0X–T40.4X

	T40.60 T40.69 AND a 6th character of 1: Accidental (unintentional) 2: Intentional self-harm 3: Assault 4: Undetermined intent AND a 7th character of A OR missing OR Abscess or Cellulitis: A48.0, G06.1, G06.2, L02.11, L02.413, L02.414, L02.415, L02.416, L02.419, L02.511, L02.512, L02.519, L02.611, L02.612, L02.619,L02.91, L03.011, L03.012, L03.019, L03.031, L03.032, L03.039, L03.113, L03.114, L03.115, L03.116, L03.119, L03.22, L03.90 Infection-related Arthritis: M00.0*, M00.2*, M00.8*, (where * is a wildcard indicating any character in the 5th digit) M00.9 Endocarditis: B37.6, I33.0, I33.9, I38, I39 5. Find the population: Count the unique number of individuals who had at least one opioid-related ED visit during the measurement period. This is the population. An individual may be counted in the population only once, though multiple opioid-related ED visits may be observed and considered to assess whether an individual meets criteria to be included in the operational definition.
Operational Definition	1. For each opioid-related ED visit identified in population, identify visits that include at least one claim for naltrexone, methadone maintenance treatment, or buprenorphine in 31 days following the initial date of service for the ED visit. Note that the MOUD claim does not have to occur during the measurement period, just in the 31 days following the ED event (inclusive of the day of visit). MOUD that occurs on the same date as the ED visit should be included in the 31 days. 2. Use National Drug Code (NDC) numbers for naltrexone and buprenorphine. (For a description of how NDCs were included in the measures, please see ***Appendix C***.) 3. Use Healthcare Common Procedure Coding System (HCPCS) codes for any MOUD. States should use HCPCS codes and criteria that best

	reflect state policy and coding. For site-specific information on MOUD HCPCS codes, see ***Appendix D.*** 4. Count the number of unique individuals who had an MOUD in the 31 days following an opioid-related ED visit. If an individual had multiple opioid-related ED visits in the measurement period, and at least one event met the measure criteria, the individual is in the operational definition. An individual may be counted in the operational definition only once. **Community Attribution:** Identify HCS communities by location of residence. Use the most recent residence record from the population to determine HCS community. **Note:** in this measure, an individual who has multiple opioid-related ED visits in a measurement period has multiple "chances" to be successfully linked to MOUD but may be counted only once in the operational definition and once in the population.
Stratifications	For calendar year and evaluation period only. **Age:** 18–34, 35–54, 55–64 years, calculated as of last day of measurement period **Sex:** Male, female **Race/Ethnicity:** Hispanic, Non-Hispanic White, Non-Hispanic Black, Non-Hispanic Other, missing
Limitations	This measure captures the number of unique individuals who receive MOUD after an opioid-related ED visit during the measurement period, regardless of how many ED events they experienced during the measurement period. Therefore, an individual who has one opioid-related ED visit and receives MOUD within 31 days is counted the same as someone who has four visits and receives MOUD after just one of them. Aggregation should not be used across measurement periods, nor should rates be compared between measurement periods of different lengths. The advantage of this method is that no stipulations are needed to qualify which visits should be captured in the population (e.g., first occurrence in measurement period, events followed by 30 days without another event). This measure is limited to individuals enrolled in Medicaid. Since the population is derived from ED visits only, it excludes individuals with an opioid-related visit in other health care settings. Additionally, MOUD rendered in a setting where Medicaid is not the primary payer are not included. Indication of death following a population event is not determinable in all states. Therefore, the population may include events where an individual died on the event date or during the 31-day follow-up period. MOUD administered in the ED setting is not captured in Medicaid claims data. As this measure assigns enrollees to HCS community based on community of residence, individuals who have an opioid overdose treated in the HCS community but reside elsewhere will not be included in analysis.
Notes	**ICD-10-CM Diagnosis Codes for serious infections:**

	Abscess and/or Cellulitis: A48.0, G06.1, G06.2, L02.11, L02.413, L02.414, L02.415, L02.416, L02.419, L02.511, L02.512, L02.519, L02.611, L02.612, L02.619,L02.91, L03.011, L03.012, L03.019, L03.031, L03.032, L03.039, L03.113, L03.114, L03.115, L03.116, L03.119, L03.22, L03.90 **Note:** The abscess and/or cellulitis codes were converted ICD-9-CM Diagnosis Codes identified in Tookes et al. (2015) to ICD-10-CM Diagnosis Codes and reviewed with Dr. Simeon Kimmel, infectious disease and addiction clinician and researcher. The Data Capture Work Group excluded furuncle and carbuncle and focused on skin/soft tissue infections and limited cutaneous abscesses and cellulitis to common sites of injection, including the neck, extremities, hands, fingers, and feet. Infectious Arthritis: M00.0*, M00.2*, M00.8*, (where * is a wildcard indicating any character in the 5th digit) M00.9 **Note:** Started with list of ICD-10-CM Diagnosis Codes in Marks et al. (2019) and added M00.2* (streptococcal arthritis) (where * is a wildcard indicating any character in the 5th digit) and M00.9 (pyogenic arthritis, unspecified), after review with Dr. Simeon Kimmel, Infectious Disease and Addiction Clinician. Infectious Endocarditis: B37.6, I33.0, I33.9, I38, I39 **Note:** Generated initial list from Felischauer et al. (2017) and Schranz et al. (2019). After review with Dr. Simeon Kimmel, Infectious Disease and Addiction Clinician, the Data Capture Work Group kept B37.6 (candida endocarditis), which is included in Schranz et al. but not in Fleischauer et al., and excluded A32.82 (listerial endocarditis), which is included in Schranz et al. only due to its clinical relevance for injection drug use–associated endocarditis.
Resources	Council of State and Territorial Epidemiologists. (2021). *Indicator-specific regular expressions*. https://resources.cste.org/ICD-10-CM/Standardized%20Validation%20Datasets/Indicator-Specific%20Regular%20Expressions_4-8-21.pdf Council of State and Territorial Epidemiologists. (2020). *Drug overdose indicator*. https://resources.cste.org/ICD-10-CM/Drug%20Overdose%20Indicator/Drug%20Overdose%20Indicator.pdf Council of State and Territorial Epidemiologists. (2020). *Programming resources and standardized validation datasets*. https://resources.cste.org/Injury-Surveillance-Methods-Toolkit/Home/ProgrammingResources Fleischauer, A. T., Ruhl, L., Rhea, S., & Barnes, E. (2017). Hospitalizations for endocarditis and associated health care costs among persons with diagnosed drug dependence – North Carolina, 2010-2015. *MMWR. Morbidity and mortality weekly report, 66*(22), 569–573. https://doi.org/10.15585/mmwr.mm6622a1 Marks, L. R., Munigala, S., Warren, D. K., Liang, S. Y., Schwarz, E. S., & Durkin, M. J. (2019). Addiction medicine consultations reduce readmission

	rates for patients with serious infections from opioid use disorder. *Clinical Infectious Diseases, 68*(11), 1935–1937. https://doi.org/10.1093/cid/ciy924 Schranz, A. J., Fleischauer, A., Chu, V. H., Wu, L. T., & Rosen, D. L. (2019). Trends in drug use-associated infective endocarditis and heart valve surgery, 2007 to 2017: A study of statewide discharge data. *Annals of Internal Medicine, 170*(1), 31–40. https://doi.org/10.7326/M18-2124 Tookes, H., Diaz, C., Li, H., Khalid, R., & Doblecki-Lewis, S. (2015). A cost analysis of hospitalizations for infections related to injection drug use at a county safety-net hospital in Miami, Florida. *PloS one, 10*(6), e0129360. https://doi.org/10.1371/journal.pone.0129360

M 2.12.2: Number of opioid-related emergency department visits with MOUD follow-up within 31 days (Medicaid)

Measure Description	Number of opioid-related emergency department (ED) visits during the measurement period among individuals enrolled in Medicaid aged 18-64 where the individual received a medication for OUD within 31 days of the initial date of service.
Background	Linking individuals to MOUD following an opioid-related ED visit is associated with reduced opioid overdose mortality. An individual presenting at the ED with an opioid-related condition may be at higher risk of an opioid overdose later, and connecting to MOUD is a priority for preventing adverse outcomes.
Data Sources	Administrative Medicaid claims data **Kentucky:** Kentucky Cabinet for Health and Family Services, Department for Medicaid Services **Massachusetts:** Massachusetts Executive Office of Health and Human Services **New York:** New York State Department of Health, Office of Health Insurance Programs **Ohio:** Ohio Department of Medicaid
Measurement Periods	Quarter, calendar year, and HCS evaluation period (July 1, 2021–June 30, 2022)
Population	Methodology for identifying opioid overdoses is from the Council of State and Territorial Epidemiologists' ICD-10-CM Injury Surveillance Toolkit. (For ICD-10-CM Diagnosis Codes, Procedure Codes, and descriptions, please see https://icd10cmtool.cdc.gov/?fy=FY2021.) 1. Identify all individuals who were 18 to 64 years of age at any point during the measurement period and who were not dual eligible (for Medicaid and Medicare) during the first month of the measurement period.

2. Identify those residing in HCS communities with address of residence. If an individual resides in multiple communities throughout the measurement period, choose the most recent community of residence during the measurement period. If the most recent community is not an HCS community that individual is excluded.
3. Identify all ED visits. For those individuals identified in step 2, select all ED visits that occur during the measurement period. If an individual had multiple ED visits during the measurement period, each visit is retained.

   Identify ED claims with

   Current Procedural Terminology/Healthcare Common Procedure Coding System (CPT/HCPCS) codes of

   99281

   99282

   99283

   99284

   99285

   G0380

   G0381

   G0382

   G0383

   G0384

   OR

   Revenue Codes of

   0450

   0451

   0452

   0456

   0459

   0981

   OR

   Place of Service Code of 23
4. Limit to opioid-related ED visits: Of ED visits discovered in step 3, identify and retain only the opioid-related visits that include any of the following:

   ICD-10-CM Diagnosis Codes (in any position—logical OR between each sub-bullet) of

   T40.0X

	T40.1X T40.2X T40.3X T40.4X T40.60 T40.69 AND a 6th character of 1: Accidental (unintentional) 2: Intentional self-harm 3: Assault OR 4: Undetermined intent AND a 7th character of A OR missing OR Abscess or Cellulitis: A48.0, G06.1, G06.2, L02.11, L02.413, L02.414, L02.415, L02.416, L02.419, L02.511, L02.512, L02.519, L02.611, L02.612, L02.619,L02.91, L03.011, L03.012, L03.019, L03.031, L03.032, L03.039, L03.113, L03.114, L03.115, L03.116, L03.119, L03.22, L03.90 Infection-related Arthritis: M00.0*, M00.2*, M00.8*, (where * is a wildcard indicating any character in the 5th digit)M00.9 Endocarditis: B37.6, I33.0, I33.9, I38, I39 5. Find the population: Count the unique number of opioid-related ED visits during the measurement period. This count of visits is the population. Note that in this measure, an individual may have multiple qualifying visits during the measurement period and each one of these visits counts towards the population, with one exception. An individual can only have one visit per date of service (a unique visit is defined as a unique date of service and enrollee ID).
Operational Definition	1. For each opioid-related ED visit identified in population, identify visits that include at least one claim for naltrexone, methadone maintenance treatment, or buprenorphine in the 31 days following the initial date of service. Note that the MOUD claim does not have to occur during the measurement period, just in the 31 days following the initial date of

	service of the ED event. MOUD claims on the same date as the event should be included in the 31 days. 2. Use National Drug Codes (NDC) for prescription oral MOUD. (For a description of how NDCs were included in the measures, please see ***Appendix C***.) 3. Use HCPCS codes for office-administered MOUD. HCPCS codes may vary by state. States should use HCPCS codes and criteria that best reflect state policy and coding. For site-specific information on naltrexone HCPCS codes, see ***Appendix D.*** 4. Count the number of opioid-related ED visits in which the individual had at least one MOUD claim in the 31 days following the initial date of service for the ED visit. This is the operational definition. An individual may have more than one ED visit that meets operational definition criteria during the measurement period and all of these qualifying visits should be counted. This is the operational definition. **Note**: This measure does not require continuous enrollment during the measurement period. **Note:** that in this measure, an individual who has multiple ED or inpatient visits in the measurement period will be counted for each event, meaning the population aims to represent the number of "chances" an individual has for follow-up after an event. **Community Attribution:** Identify HCS communities by location of residence. Use the most recent residence record from the population to determine HCS community.
Stratifications	For calendar year and evaluation period only. **Age:** 18–34, 35–54, 55–64 years, calculated as of last day of measurement period **Sex:** Male, female **Race/Ethnicity:** Hispanic, Non-Hispanic White, Non-Hispanic Black, Non-Hispanic Other, missing
Limitations	An individual with an opioid-related ED event is assessed for MOUD receipt for 31 days following the event. During this period, they may have another opioid-related ED event and begin another 31-day follow-up period, which may overlap with the previous follow-up period. If the individual has an MOUD claim during this overlap, they will have two events that meet criteria for inclusion in the operational definition, despite having only one MOUD claim. This could lead to an overcount of connection to MOUD following ED events, which is the main objective of the measure. The advantages of this method are that no stipulations are needed to qualify which events should be captured in the population (e.g., first occurrence in measurement period, events followed by 31 days without another event), and a particular individual may have multiple events or "chances" for MOUD follow-up spread through the measurement period, each of which will be counted toward the population. This measure is limited to individuals enrolled in

	Medicaid. Because the population is derived from ED visits only, it does not include individuals with an opioid-related visit in other health care settings. Additionally, MOUD rendered in a setting where Medicaid is not the primary payer will be excluded. Indication of death following a population event is not determinable in all states. Therefore, the population may include events where an individual died on the event date or during the 31-day follow-up period. MOUD administered in ED or inpatient setting is not captured in Medicaid claims data. As this measure assigns enrollees to HCS community based on community of residence, individuals who have an opioid overdose treated in the HCS community but reside elsewhere will not be included in analysis.

M 2.13: Number of individuals with a new high-risk opioid prescribing episode (outcome measure for HCS Hypothesis 4)

Measure Description	Number of individuals aged 18+ who were newly exposed (after a ≥45-day wash-out period) to a high-risk opioid prescribing episode.
Background	High-risk opioid prescribing is associated with an increase in opioid-overdose mortality. The U.S. Centers for Disease Control and Prevention (CDC) identified four types of high-risk opioid prescribing (Dowell et al, 2022): A. New opioid prescribing episode with a duration of more than 30 days (continuous opioid receipt with gap of no more than 7 days) B. New opioid prescribing episode with extended-release or long-acting opioid formulation; C. New high-dose opioid prescribing, defined as ≥90 mg morphine milligram equivalent (MME) over 3 calendar months; and D. New overlapping opioid and benzodiazepine prescriptions for at least 30 days over 3 calendar months.
Data Sources	PDMP data **Kentucky:** Kentucky Cabinet for Health and Family Services, Office of Inspector General, Division of Audits and Investigations **Massachusetts:** Massachusetts Department of Public Health, Office of Prescription Monitoring and Drug Control **New York:** New York State Department of Health, Bureau of Narcotic Enforcement and New York State Department of Health, Office of Science **Ohio:** Ohio Board of Pharmacy
Measurement Periods	Month, quarter, calendar year, and HCS evaluation period (July 1, 2021–June 30, 2022)
Population	The population includes residents of HCS communities aged 18+. See Population Submeasure P.1.1 (18+) or P.2.1 (18+) for more details.

Operational Definition	**M 2.13.A: Number of individuals with a new opioid prescribing episode with a duration of more than 30 days** ***Appendix B*** contains detailed specifications for developing a PDMP analytic data set. 1. Select the opioid prescription fills identified in step N of ***Appendix B*** in which the patient is at least 17 years of age on the date of the fill. 2. From the table created in step 1, use the date filled and days supplied to calculate a run-out date (date of filled prescription + days supplied). 3. Compare the fill dates and run-out dates of each prescription. If one prescription completely overlaps a prescription with a shorter duration and an earlier run-out date (fill date B ≥ fill date A and run-out date B < run-out date A) then remove the prescription with the shorter duration. 4. Calculate the days between the run-out date of each filled prescription and the fill date of the subsequent prescription. This is the treatment gap. 5. Group consecutive prescriptions without a gap of >7 days as a period of continual treatment. 6. In addition to the treatment gap defined in step 4, also fill in the treatment gap variable for the first opioid fill for each patient using the start date identified in step A of ***Appendix B***. Treatment gaps prior to each opioid fill can be considered a washout period. 7. Flag any opioid fill preceded by a washout period of ≥45 days as a new opioid episode. *Note: 45-day washout consistent with U.S. CDC Opioid Prescribing QI Measures.* 8. Flag periods of continual treatment of ≥31 days. 9. Flag any instances where a new opioid episode (step 7) lasts ≥31 days (step 8). 10. From the flagged instances in step 9, delete instances where the patient was less than 18 years of age when the instance started. 11. Create a table of patient IDs and the start dates of all instances that are flagged in step 10. 12. Summarize the table from step 11 by selecting unique combinations of patients ID, year of start date, quarter of start date, and month of start date. 13. Join the table created in step 12 with the table created in step J of ***Appendix B*** on patient ID, year, and month. 14. Join the table created in step 12 with the table created in step K of ***Appendix B*** on patient ID, year, and quarter. 15. Join the table created in step 12 with the table created in step L of ***Appendix B*** on patient ID and year, creating separate counts for both calendar (January–December) and comparison (July–June) years. 16. Create monthly counts of unique patients by HCS community from the table created in step 13, quarterly counts of unique patients by HCS

community from the table created in step 14, and yearly counts of unique patients by HCS community from the table created in step 15.

Note that the counts for the final two months of measure 2.13A will be artificially low because some individuals have not had the opportunity to accrue 31 days in a new opioid episode. For example, if the available data ends 12/31/2023 then an individual starting an opioid prescription on 12/15/2023 cannot reach 31 days in the available data. While this does not affect the calculation of the measure, incomplete months, quarters, and years should be marked as incomplete before the results are output. See step 57 below.

M 2.13.B: Number of individuals starting a new opioid prescribing episode with extended-release or long-acting opioid formulation

17. From the prescription fills in step N of ***Appendix B***, identify fills of extended release or long-acting opioids.
18. Flag all new opioid episodes, as specified in steps 1-7 above.
19. Flag all instances where an extended release or long-acting opioid (step 17) is filled on the first day of a new opioid episode (step 18).
20. From the records flagged in step 19, delete instances where an individual was less than 18 years of age when the instance started.
21. From the records flagged in step 20, create a table of each unique combination of patient ID, year of start date, quarter of start date, and month of start date.
22. Join the table created in step 21 with the table created in step J of ***Appendix B*** on patient ID, year, and month.
23. Join the table created in step 21 with the table created in step K of ***Appendix B*** on patient ID, year, and quarter.
24. Join the table created in step 21 with the table created in step L of ***Appendix B*** on patient ID and year, creating separate counts for both calendar (January–December) and comparison (July–June) years.
25. Create monthly counts of unique patients by community from the table created in step 22, quarterly counts of unique patients by community from the table created in step 23, and yearly counts of unique patients by community from the table created in step 24.

M 2.13.C: Number of individuals with a new high-dose opioid prescribing episode, defined as ≥90 mg morphine milligram equivalent (MME) over 3 calendar months

26. For each patient with a filled opioid prescription in step N of ***Appendix B***, query each available date in the dataset (defined by the start and end dates in step A of ***Appendix B***) to calculate daily combined

dosage of all filled opioid prescriptions in MME using the MME conversion factors.

27. Summarize the daily dosages into months by summing the daily dosages into total monthly dosages. Only do this for months that have complete data. For example, if the dataset starts on June 15, 2017 and ends on November 20, 2019. Do not calculate monthly dosages for June 2017 or November 2019. Create a variable with the number of days in each month (28, 29, 30, or 31).
28. Query the table created in step 27 to create a table summarized by moving quarters. If the first complete month of data is July 2017, the first moving quarter that is calculable begins July 2017 and ends September 2017. The next moving quarter begins August 2017 and ends October 2017. Calculate mean daily dosages in each moving quarter by dividing the total dosage in the moving quarter by the number of days in the moving quarter. Create a flag to indicate if the mean daily dosage in the moving quarter was ≥90 MME with a value of 1 for "yes" and 0 for "no." This an interim flag rather than final flag for this measure.
29. Lag interim flag 1 created in step 28 by 3 months to create interim flag 2.
30. Create a flag for the 2.13C measure using the following rule:

Interim flag 1	Interim flag 2	2.13C flag	Note
Null	Yes or No	Null	If either interim flag is missing, 2.13C is missing
Yes or No	Null	Null	
Yes or No	Yes	No	If interim flag 2 = yes, then 2.13C = no because it is not incident.
Yes	No	Yes	
No	No	No	

31. From the table created in step 30, delete any months prior to the month in which each participant turned 18 years of age.
32. From the table created in step 31, select the unique combinations for patient ID, year, and month where the 2.13C flag = 1;
33. From the table created in step 32, flag calendar quarters that include one or more months where 2.13C flag = 1.
34. From the table created in step 33, flag calendar years that include one or more calendar quarters where 2.13C flag = 1.
35. Join the table created in step 32 with the table created in step J of ***Appendix B*** on patient ID, year, and month.

36. Join the table created in step 33 with the table created in step K of ***Appendix B*** on patient ID, year, and quarter.
37. Join the table created in step 34 with the table created in step L of ***Appendix B*** on patient ID and years.
38. Create monthly counts of unique patients by community from the table created in step 35, quarterly counts of unique patients by community from the table created in step 36, and yearly counts of unique patients by community from the table created in step 37, creating separate counts for both calendar (January–December) and comparison (July–June) years.

M 2.13.D: Number of individuals with new overlapping opioid and benzodiazepine prescriptions for at least 30 days over 3 calendar months

39. From the list of prescription fills in step N of ***Appendix B***, use the dates of fills and days supplied to identify all dates with opioids supplied. Repeat for benzodiazepine prescriptions using the list of prescription fills in step O of ***Appendix B***.
40. For each patient in each month, count the number of days on which supplied opioids and supplied benzodiazepines overlap.
41. Query the table created in step 40 to create a table summarized by moving quarters. Calculate the number of days on which supplied opioids and supplied benzodiazepines overlap in each moving quarter. Create a flag to indicate if there are ≥31 days of overlap in the moving quarter. This is an interim flag rather than the final flag for this measure.
42. Lag the interim flag created in step 41 by 3 months to create interim flag 2.
43. Create a flag for the 2.13D measure using the rule described in step 30.
44. From the table created in step 43, delete any months prior to the month in which each participant turned 18 years of age.
45. From the table created in step 44, select the unique combinations for patient ID, year, and month where the 2.13D flag = 1.
46. From the table created in step 45, flag calendar quarters that include one or more months where 2.13D flag = 1.
47. From the table created in step 46, flag calendar years that include one or more calendar quarters where 2.13D flag = 1.
48. Join the table created in step 45 with the table created in step J of ***Appendix B*** on patient ID, year, and month.
49. Join the table created in step 46 with the table created in step K of ***Appendix B*** on patient ID, year, and quarter.

50. Join the table created in step 47 with the table created in step L of **Appendix B** on patient ID, and year.
51. Create monthly counts of unique patients by community from the table created in step 48, quarterly counts of unique patients by community from the table created in step 49, and yearly counts of unique patients by community from the table created in step 50, creating separate counts for both calendar (January–December) and comparison (July–June) years.

Combined M 2.13: Number of individuals with incident high-risk opioid prescribing

52. Join the tables created in steps 13, 22, 35, and 48 by patient ID and community. Create a new variable that is 1 (yes) if the patient was flagged for any of these four sub-outcomes in the month and 0 (no) if the patient was flagged for none of the four sub-outcomes in the month.
53. Join the tables created in steps 14, 23, 36, and 49 by patient ID and community. Create a new variable that is 1 (yes) if the patient was flagged for any of these four sub-outcomes in the quarter and 0 (no) if the patient was flagged for none of the four sub-outcomes in the quarter.
54. Join the tables created in steps 15, 24, 37, and 50 by patient ID and community. Create a new variable that is 1 (yes) if the patient was flagged for any of these four sub-outcomes in the year and 0 (no) if the patient was flagged for none of the four sub-outcomes in the year.
55. Using the variable created in step 52, create counts of unique patients in each community by month and by year.
56. Using the variable created in step 53, create counts of unique patients in each community by quarter and by year.
57. Using the variable created in the step 54, create counts of unique patients in each community by quarter and by year, creating separate counts for both calendar (January–December) and comparison (July–June) years.
58. Calculate the date 38 days prior to the end date of the dataset. Mark the month, quarter, and year that contain this date as incomplete.

Note that the counts for the final two months of measure 2.13A will be artificially low because some individuals have not had the opportunity to accrue 31 days in a new opioid episode. Because gaps of 7 days are counted in the duration of the episode, it's conceivable that on day 1 an individual fills a 30-day prescription, goes days 31-37 without opioids and refills on day 38. We need 38 days of follow-up before the counts of measure 2.13A and the composite measure 2.13 are complete. For example, if the available data ends 12/31/2019, 38 days prior is 11/23/2019. For measure 2.13A and the

	composite measure 2.13, mark the month, quarter, and year that contain 11/23/2019 as incomplete as well as any subsequent months. **Note**: Days on medication and MME assume individual uses medication dispensed equally over days supplied, starting on the dispense date. **Community Attribution:** Identify HCS communities by location of residence. **Note**: This measure captures dispensed prescriptions with National Drug Code (NDC) numbers for opioid analgesic and benzodiazepine products. (For a description of how NDCs were included in the measures, please see ***Appendix C***.) The CDC's file (CDC, 2019) was used to identify morphine milligram equivalent (MME) conversion factors and extended-release/long-acting formulations.
Stratifications	For calendar year and evaluation period only. **Age:** 18–34, 35–54, 55+ years Create stratified annual counts using the age of each patient. Calculate this with the date of birth selected in Step E and the end date of each annual period (calendar year or evaluation period). An individual patient should not be counted in more than one age stratum in the same annual period. **Sex:** Male, female, missing Use the sex that appears on each patient's final record of the annual period (calendar year or evaluation period). An individual patient should not be counted in more than one sex stratum in the same annual period.
Limitations	Opioid products that are not likely to be used in the outpatient/ambulatory pharmacy setting—such as bulk powder, bulk chemicals, and dosage forms typically used in hospitals or hospice settings (e.g., epidurals, (intravenous) IVs)—are excluded. Products classified as cough/cold/allergy combinations, cough medications, antidiarrheal/probiotic agents, buprenorphine products used for OUD and pain, and methadone products used for OUD were also excluded.
Resources	Centers for Disease Control and Prevention, National Center for Injury Prevention and Control. (2019). CDC compilation of benzodiazepines, muscle relaxants, stimulants, zolpidem, and opioid analgesics with oral morphine milligram equivalent conversion factors, 2019 version. https://archive.cdc.gov/www_cdc_gov/opioids/data-resources/index.html Wolters Kluwer (2020). Medi-Span Electronic Drug File (MED-File) v2. Dowell D, Ragan KR, Jones CM, Baldwin GT, Chou R. CDC *Clinical Practice Guideline for Prescribing Opioids for Pain — United States, 2022*. MMWR Recomm Rep 2022;71(No. RR-3):1–95. DOI: https://dx.doi.org/10.15585/mmwr.rr7103a1.

M 2.14.1: Number of naloxone units distributed through community-based programs

Measure Description	Number of naloxone units distributed through community-based programs.
Background	Overdose prevention education and naloxone distribution is an evidence-based practice that reduces opioid overdose mortality. Increased access to naloxone is critical to mitigate opioid-related harm. Naloxone is often distributed through community-based organizations and state agencies.
Data Sources	HCS records for naloxone units purchased with HCS funds and distributed to community agencies/organizations. Secondary data from state agencies or contracting agencies that distribute naloxone in HCS communities through opioid overdose education and naloxone distribution programs with support from state and federal funding. **Kentucky:** Kentucky Pharmacists Association; Kentucky Cabinet for Health and Family Services, Department for Public Health; Kentucky Office of Drug Control Policy; Kentucky Cabinet for Health and Family Services, Department for Behavioral Health, Developmental and Intellectual Disabilities **Massachusetts:** Massachusetts Department of Public Health, Bureau of Substance Addiction Services **New York:** New York State Department of Health, AIDS Institute, Office of Drug User Health **Ohio:** Ohio Department of Health, Project DAWN (Deaths Avoided With Naloxone)
Measurement Periods	Month, quarter, calendar year, and HCS evaluation period (July 1, 2021–June 30, 2022)
Population	This measure can be calculated as a rate using the following denominator: Population Measure P.1 (all ages) or P.2 (all ages). Please see the Population Measures section for details on calculation.
Operational Definition	Number of naloxone units distributed through community-based programs to HCS communities. **Attribution to HCS community and time period:**

Research Site	Community Attribution Determined By:
Kentucky	Recipient's residential address (when units purchased by state or address of the distributing agency/organization (when units purchased by HCS)
Massachusetts	Recipient's residential address when available (majority of state OEND distribution), otherwise address of distributing agency/organization
New York	Address of the distributing agency/organization
Ohio	Address of the distributing agency/organization

	<table><tr><th>Research Site</th><th>Naloxone Units Counted When:</th></tr><tr><td>Kentucky</td><td>Units are distributed to community members</td></tr><tr><td>Massachusetts</td><td>Units are distributed to community members if information is available, otherwise when units are distributed to the agency/organization</td></tr><tr><td>New York</td><td>Units are distributed to the agency/organization</td></tr><tr><td>Ohio</td><td>Units are distributed to the community members/organization</td></tr></table> **Notes:** One unit equals one kit, which equals two doses. The combination of M 2.14.1 and M 2.14.2 forms the combined M 2.14.3. The naloxone units purchased with HCS funds and distributed to HCS communities are included in M 2.14.1 and tracked specifically by M 2.14.4.
Stratifications	N/A
Limitations	Attribution for naloxone units to HCS community and time period varies by state and type of distributing organization; however, the attribution methods are applied consistently across Wave 1 and Wave 2 communities to minimize the potential for differential misclassification. When community attribution was based on the address of the agency/organization distributing naloxone, then we were unable to verify if the individuals who received the naloxone kits were HCS community residents. New York does not report monthly data.

M 2.14.2: Number of naloxone units dispensed by community pharmacies

Measure Description	Number of naloxone units dispensed by community pharmacies.
Background	Overdose prevention education and naloxone distribution is an evidence-based practice that reduces opioid overdose mortality. Increased access to naloxone is critical to mitigate opioid-related harm. Naloxone is dispensed by community pharmacies.
Data Sources	IQVIA prescription database, xPONENT® The IQVIA data provide counts of dispensed naloxone units from retail pharmacies. The database captures 92% of all prescription transactions nationally, and IQVIA utilizes a proprietary algorithm to account for the non-sampled portion when providing estimates.
Measurement Periods	Month, quarter, calendar year, and HCS evaluation period (July 1, 2021–June 30, 2022)

Population	This measure can be calculated as a rate using the following denominator: Population Measure P.1 (all ages) or P.2 (all ages). Please see the Population Measures section for details on calculation.
Operational Definition	The measure assumes that "number of units" is equivalent to "number of prescriptions." The operational definition is defined as summation of all prescriptions (all National Drug Codes) captured by variable "Projected Total Rx" for the measurement period. (For a description of how National Drug Codes [NDCs] were included in the measures, please see ***Appendix C***.) The variable is calculated with up to four decimal points and should not be rounded to avoid loss of precision at aggregation. **Notes:** One unit equals one kit, which equals two doses. The combination of M 2.14.1 and M 2.14.2 forms the combined M 2.14.3. **Community attribution**: HCS communities are assigned based on the location of the pharmacy outlet.
Stratifications	N/A
Limitations	The three limitations of this data source are as follows: (1) no information is provided about the number of pharmacies dispensing naloxone prescriptions; (2) suppression rules preclude reporting of data for geographic areas with fewer than four pharmacies; and (3) prescriptions are assigned to communities based on the location of the pharmacy rather than the customer's residence. Three communities had fewer than four retail pharmacies reporting data to IQVIA and per data use restrictions, data could not be reported at the community level. For these communities, we report a weighted mean number of naloxone units for each community based on population size. The assignment of a pharmacy to a community based on pharmacy address may result in an overcount of naloxone in a community with pharmacies that serve residents of non-HCS communities or an undercount if a pharmacy is just outside an HCS community but serves HCS residents.

M 2.14.3: Number of naloxone units distributed in community - combined (outcome measure for HCS Hypothesis 2)

Measure Description	Number of naloxone units distributed through community-based programs; dispensed by community pharmacies; or purchased with HCS funds and distributed to community agencies/organizations.
Background	Overdose prevention education and naloxone distribution is an evidence-based practice that reduces opioid overdose mortality. Increased access to naloxone is critical to mitigate opioid-related harm. This measure reports the number of naloxone units distributed in communities through

	community-based programs and through retail pharmacies by combining the counts reported in Measures 2.14.1 and 2.14.2.
Data Sources	HCS records for naloxone units purchased with HCS funds and distributed to community agencies/organizations. Secondary data from state agencies or contracting agencies that distribute naloxone in HCS communities through overdose education and naloxone distribution programs with support from state and federal funding. IQVIA prescription database, xPONENT® **Kentucky:** Kentucky Pharmacists Association; Kentucky Cabinet for Health and Family Services, Department for Public Health; Kentucky Office of Drug Control Policy; Kentucky Cabinet for Health and Family Services, Department for Behavioral Health, Developmental and Intellectual Disabilities **Massachusetts:** Massachusetts Department of Public Health, Bureau of Substance Addiction Services **New York:** New York State Department of Health, AIDS Institute, Office of Drug User Health **Ohio:** Ohio Department of Health
Measurement Periods	Month, quarter, calendar year, and HCS evaluation period (July 1, 2021–June 30, 2022)
Population	This measure can be calculated as a rate using the following denominator: Population Measure P.1 (all ages) or P.2 (all ages). Please see the Population Measures section for details on calculation.
Operational Definition	Number (count) of naloxone units distributed in the HCS communities during the measurement period as captured by summing the following Submeasures: M 2.14.1: Number of naloxone units distributed through community-based programs M 2.14.2: Number of naloxone units dispensed by community pharmacies **Note:** One unit equals one kit, which equals two doses. The naloxone units purchased with HCS funds and distributed to HCS communities are tracked by M 2.14.4.
Stratifications	N/A
Limitations	When community attribution was based on the address of the agency/organization distributing naloxone, then we were unable to verify if the individuals who received the naloxone kits were HCS community residents. New York does not report monthly data.

M 2.14.4: Number of naloxone units purchased with HCS funds

Measure Description	Number of naloxone units purchased with HCS funds and distributed to community agencies/organizations.
Background	Overdose prevention education and naloxone distribution is an evidence-based practice that reduces opioid overdose mortality. Increased access to naloxone is critical to mitigate opioid-related harm. Some naloxone units were purchased with funds from the HCS and distributed to community agencies and organizations.
Data Sources	HCS records for naloxone units purchased with HCS funds and distributed to community agencies/organizations.
Measurement Periods	Month, quarter, calendar year, and HCS evaluation period (July 1, 2021–June 30, 2022)
Population	This measure can be calculated as a rate using the following denominator: Population Measure P.1 (all ages) or P.2 (all ages). Please see the Population Measures section for details on calculation.
Operational Definition	This measure reports the number of naloxone units purchased with HCS funding and distributed in HCS communities. **Attribution to HCS community:** The HCS-funded naloxone distribution is attributed to the community where the distributing agency/organization is located.

Research Site	Naloxone Units Counted When:
Kentucky	Units are distributed to community members
Massachusetts	Units are distributed to the agency/organization
New York	New York did not use HCS funds to purchase naloxone units. Counts listed as zero.
Ohio	Reporting in Ohio was inconsistent across communities. Counts listed as null values.

Notes:

One unit equals one kit, which equals two doses.

M 2.14.4 is a component of M 2.14.1.

Stratifications	N/A
Limitations	N/A

M 2.15: Number of individuals with OUD who are screened, diagnosed, and treated for hepatitis C (Medicaid)

Measure Description	Number of individuals enrolled in Medicaid aged 18-64 diagnosed with OUD within 12 months of the measurement period who were screened, diagnosed, and treated for hepatitis C during the measurement period.
Background	Due to injection drug use, the prevalence of hepatitis C infections is high among those who are diagnosed with OUD. This makes OUD treatment facilities an important setting for individuals to access services for hepatitis C screening, diagnosis, and treatment.
Data Sources	Administrative Medicaid claims data **Kentucky:** Kentucky Cabinet for Health and Family Services, Department for Medicaid Services **Massachusetts:** Massachusetts Executive Office of Health and Human Services **New York:** New York State Department of Health, Office of Health Insurance Programs **Ohio:** Ohio Department of Medicaid
Measurement Periods	Quarter, calendar year, and HCS evaluation period (July 1, 2021–June 30, 2022)
Population	1. Identify all individuals who were 18 to 64 years of age at any point during the measurement period and who were not dual eligible (for Medicaid and Medicare) during the first month of the measurement period. 2. Limit to individuals residing in HCS communities. 3. Count unique individuals with an ICD-10-CM code suggestive of OUD (ICD-10-CM Diagnosis Code of F11.1X or F11.2X) in any setting (inpatient, outpatient, or professional claims), in any position during the 12 months preceding or during the measurement period. (For the full list of ICD-10-CM Diagnosis Codes and descriptions, please see https://icd10cmtool.cdc.gov/?fy=FY2021.) This is the population.
Operational Definition	**M 2.15.1: Number of individuals with OUD who are screened for hepatitis C** Of individuals in the population, count unique individuals who had at least one claim during the measurement period indicating screening for hepatitis C virus (HCV). Any one of the following procedure codes Current Procedural Terminology/ Healthcare Common Procedure Coding System (CPT/HCPCS) (codes based on the Medicaid Outcomes Distributed Research Network [MODRN] measure codes) meet the criteria for HCV screening**:** 80074

86803

86804

87520

87521

87522

87902

3218F

3220F

3266F

G0472

G9203

G9207

M 2.15.2: Number of individuals with OUD who are diagnosed with hepatitis C

Of individuals in the population, count unique individuals who had at least one claim during the measurement period indicating a diagnosis of HCV. Any of the following ICD-10-CM Diagnosis Codes on the claim—in any encounter and any position—meet the criteria for HCV diagnosis:

Z22.52

B17.10

B17.11

B18.2

B19.2

B19.20

B19.21

M 2.15.3: Number of individuals with OUD who are treated for hepatitis C

Of individuals in the population, count unique individuals who had at least one claim during the measurement period indicating treatment for HCV. A prescription during the measurement period with a National Drug Code (NDC) number for any of the following medications meets criteria for HCV treatment (For a description of how NDCs were included in the measures, please see ***Appendix C***.):

Daclatasvir

Elbasvir-Grazoprevir

Glecaprevir-Pibrentasvir

	Ledipasvir-Sofosbuvir Ombitasvir-Paritaprevir-Ritonavir Ombitasvir-Paritaprevir-Ritonavir and Dasabuvir Peginterferon alfa-2a Peginterferon alfa-2b Ribavirin Simeprevir Sofosbuvir Sofosbuvir-Velpatasvir Sofosbuvir-Velpatasvir-Voxilaprevir **Note**: This measure does not require continuous enrollment during the measurement period. **Community Attribution:** Identify HCS communities by location of residence. Use the most recent residence record from the population (12 months prior to measurement period, plus measurement period) to determine HCS community.
Stratifications	For calendar year and evaluation period only. **Age:** 18–34, 35–54, 55–64 years, calculated as of last day of measurement period **Sex:** Male, female **Race/Ethnicity:** Hispanic, Non-Hispanic White, Non-Hispanic Black, Non-Hispanic Other, missing
Limitations	This measure will exclude from the population individuals without a claim with an ICD-10-CM code suggestive of OUD, and those for whom Medicaid was not the primary payer.

M 2.16: Number of newly diagnosed HIV cases

Measure Description	Number of individuals aged 18+ who received a new HIV diagnosis.
Background	Injection drug use puts individuals at higher risk for acquiring HIV. Treatment and harm reduction efforts reduce the risk for HIV transmission among individuals who use drugs.
Data Sources	State-specific registry for HIV/AIDS reporting **Kentucky:** Cabinet for Health and Family Services, Department for Public Health **Massachusetts:** Massachusetts Department of Public Health, Bureau of Infectious Disease and Laboratory Sciences, Division of STD Prevention

	New York: New York State Department of Health, AIDS Institute **Ohio:** Ohio Department of Health, HIV/AIDS Surveillance Program
Measurement Periods	Calendar year
Population	This measure can be calculated as a rate using the following denominator: Population Submeasure P.1.1 (18+) or P.2.1 (18+). Please see the Population Measures section for details on calculation. **Note:** Ohio reported data for individuals aged 14+ years
Operational Definition	Count of new HIV cases during the reporting period that are residents of HCS communities.
Stratifications	N/A
Limitations	Delays exist between the time HIV infection is diagnosed and the time the infection is reported to the reporting agencies. As a result of reporting delays, statistics may not be complete. Underreporting is also a concern, especially in areas where testing is not as common.

M 2.17: Number of opioid-related overdoses treated in the emergency department and captured by syndromic surveillance data

Measure Description	Number of suspected opioid overdose emergency department (ED) encounters captured by syndromic surveillance.
Background	Syndromic surveillance involves the rapid collection and submission of emergency department and inpatient data by hospitals and clinics in near real-time. The quality and completeness of this data may vary more compared to the more time-lagged traditional administrative claims billing data (e.g., see Measure 2.3). Consequently, definitions for opioid overdose may include combinations of ICD-10-CM codes and keywords from chief complaint elements.
Data Sources	Kentucky and Massachusetts use the U.S. CDC's National Syndromic Surveillance Program (NSSP) platform, Electronic Surveillance System for the Early Notification of Community-based Epidemics (ESSENCE). New York uses a local implementation of the ESSENCE system: Electronic Syndromic Surveillance System (ESSS). Ohio uses a local implementation of EpiCenter. **Kentucky:** Cabinet for Health and Family Services, Department for Public Health, Division of Epidemiology and Health Planning **Massachusetts:** Massachusetts Department of Public Health, Bureau of Infectious Diseases and Laboratory Sciences **New York:** New York State Department of Health Bureau of Surveillance and Data Systems

	Ohio: Ohio Department of Health, Violence and Injury Epidemiology and Surveillance Section
Measurement Periods	Month, quarter, calendar year, and HCS evaluation period (July 1, 2021–June 30, 2022)
Population	This measure can be calculated as a rate using the following denominator: Population Submeasure P.1.1 (18+) or P.2.1 (18+). Please see the Population Measures section for details on calculation.
Operational Definition	This measure is calculated for all suspected opioid-overdose ED encounters for target communities using syndromic surveillance. The definition presented here is based on the classification developed in collaboration with the U.S. CDC Enhanced State Opioid Overdose Surveillance states, the U.S. CDC National Center for Injury Prevention and Control, and the U.S. CDC NSSP. **For national instance of syndromic surveillance (ESSENCE):** 1. ESSENCE Query Fields Geography System-Region = Selected HCS Communities* Has Been Emergency = Yes CC (Chief Complaint) and DD (Discharge Diagnosis) Category = U.S. CDC Opioid Overdose v3 **For local instance of syndromic surveillance (ESSENCE):** 1. Local instances of syndromic data may have different variable names or sub-setting options. However, if they are running the latest version of ESSENCE, the definitions should be the same as the national version. If the predefined definition and definition is not available, sites will use the regular expression definition version of the definition following this section. 2. Query details. Counts are aggregated into unique encounters/visits of suspected opioid involved overdoses for target counties. This is different than the unique number of persons (e.g., in a given period, an individual may have multiple encounters). 3. ESSENCE Query Fields [Community field] = Selected HCS Community* [Has Been Emergency] = Yes [CCDD] = Concatenate the CC (Chief Complaint) and DD (Discharge Diagnosis) into one field to apply the query * HCS communities may be defined geographically by patient resident zip code or patient resident community. Respective resident locations should be selected for analysis of community-level suspected opioid overdose ED encounters.

Note: If patient resident location is unavailable in the dataset, hospital-level analysis may be substituted as a proxy only when the vast majority of patients seen at a given hospital is representative of the targeted HCS community. New York State will be using hospital location.

The Programmed Query:

Note: In ESSENCE, this is a regular, expression-like code and can readily be adapted to regular expressions scans of the concatenated CC (Chief Complaint) and DD(Discharge Diagnosis) fields.

"U.S. CDC Opioid Overdose v3" ESSENCE definition applied to CCDD:

(,^narcan^,or,^naloxo^,or,^[;/]T40.[012346][X0129][14]A^,or,^[;/]T40[012346][X0129][14]A^,or,^[;/]F11.12^,or,^[;/]F11.22^,or,^[;/]F11.92^,or,^[;/]F1112^,or,^[;/]F1122^,or,^[;/]F1192^,or,^[;/]965.0[0129][;/]^,or,^[;/]9650[0129][;/]^,or,^[;/]E850.[012]^,or,^[;/]E850[012]^,or,^295174006^,or,^295175007^,or,^295176008^,or,^295165009^,or,^242253008^,or,^297199006^,or,^295213004^,),or,(,(,(,^poison^,or,^verdo[se][se]^,or,^overdose^,or,^overose^,or,^nodding^,or,^ nod ^,or,^snort^,or,^in[gj]est^,or,^intoxic^,or,^unresponsiv^,or,^loss of consciousness^,or,^syncop^,or,^shortness of breath^,or,^short of breath^,or,^altered mental status^,) ,and, (,^her[io][oi]n^,or,^ hod ^,or,^speedball^,or,^speedball^,or,^dope^,or,^opioid^,or,

^op[io][oi]d^,or,^opiate^,or,^opate^,or,^op[iu][ui]m^,or,^opum^,or,^methadone^,or,^suboxone^,or,^oxyco^,or,^oxyi^,or,^oxy^,or,^percoc^,or,^vicod^,or,^fent^,or,^hydrocod^,or,^morphin^,or,^cod[ei][ie]n^,or,^codene^,or,^oxymor^,or,^dilaud^,or,^hydromor^,or,^tramad^,or,^suboxin^,or,^buprenorphine^,or,^Abstral^,or,^Actiq^,or,^Avinza^,or,^Butrans^,or,^Demer[oa]l^,or,^Dolophine^,or,^Duragesic^,or,^Fentora^,or,^Hysingla^,or,^Methadose^,or,^Morphabond^,or,^Nucynta^,or,^Onsolis^,or,^Oramorph^,or,^Oxaydo^,or,^Roxanol^,or,^Sublimaze^,or,^Xtampza^,or,^Zohydro^,or,^Anexsia ^,or,^Co-Gesic^,or,^Embeda^,or,^Exalgo^,or,^Hycet^,or,^Hycodan^,or,^Hydromet^,bor,^Ibudone^,or,^Kadian^,or,^Liquicet^,or,^Lorcet^,or,^Lortab^,or,^Maxidone^,or,^ MS Contin ^,or,^Norco ^,or,^Opana^,or,^Oxycet^,or,^Palladone^,or,^Percodan^,or,^Reprexain^,or,^Rezira^,or,^Roxicet^,or,^Targiniq^,or,^TussiCaps^,or,^Tussione^,or,^Tuzistra^,or,^Vicoprofen^,or,^Vituz^,or,^Xartemis^,or,^Xodol^,or,^Zolvit^,or,^Zutripro^,or,^Zydone^,or,^Ultram^,or,^[;/]F11.[129]0^,or,^[;/]F11[129]0^,),), and not,(,^no loss of consciousness^,or,^denie[sd] loss of consciousness^,or,^negative loss of consciousness^,or,^denies any loss of consciousness^,or, ^denies her[io][oi]n^,or,^deny her[io][oi]n^,or,^denied her[io][oi]n^,or,^denyingher[io][oi]n^,or, ^denies drug^,or,^deny drug^,or,^denied drug^,or,^denying drug^,or,^denies any drug^,or,^with dra^,or,^withdra^, or,^detoxification^,or,^detos^,or,^detoz^,or,^dtox^,or,^ oxy sat ^,or,^ oxy state ^,or,^oxy high^,or,^oxy low^,or,^oxy mask ^,or,^oxy given^,or,^given oxy ^,or,^oxyclean^,or,^low oxy ^,or,^high oxy ^,or,^placed on oxy ^,or,^pulse oxy ^,or,^oxy deep cleaner^,or,^not enough oxy ^,or,^oxy level^,or,^sedat ^,or,^received fentanyl^,or,^administered fentanyl^,or,^given fentanyl^,or,^fentanyl en route^,or,^fentanyl enrt^,or,^fent en route^,or,^fentanyl given^, or,^fentynl given^,or,^gave

	fent^,or,^gave fentanyl^,or,^given fentanly^,or,^mcgfentanyl^,or, ^mcg fent^,or,^mcg of fent^,or,^fentanyl 75^,or,^fentanyl 50^,or,^50 fentanyl^,or,^fentanyl 100^,or,^100 fentanyl^,or,^fentanyl 150^,or,^intranasal fent^,or,^milligram of fentanyl^,or,^ fenton ^,or,^fent pta^,or,^fentanyl pta^,or,^fentynl 100 ^,or,^fentynyl 100^,or,^fentynal 50^,or,^fentynl 50^,or,^fent 100^,or,^fent 150^,or,^diffently^,or, ^received fent ^,or,^received fent ^,or,^ given 50 ^,or,^ given 100 ^,or,^ given 150 ^,or,^ gave 50 ^,or,^ gave 100 ^,or,^ gave 150 ^,or, ^ doses of fent ^,),) **Rate:** Rates can be presented per population of 100,000 residents.
Stratifications	N/A
Limitations	**Important Note:** Syndromic data is *very rarely* of sufficient quality to present as a substitution for morbidity counts due to the quality issues that may impact syndromic systems and fundamental differences, such as the following: Variable online/offline of data Quality of discharge diagnosis (completeness and comparability to the number of codes in discharge data) Inequivalent query-able fields (Syndromic data contain free-text elements; traditional morbidity is limited to *International Classification of Diseases* [ICD] codes only.) Quality of patient type (Patient class in syndromic data may not be captured accurately.) (e.g., assignment of patient class based on facility type rather than specific encounter type) Inequivalence of residence (Syndromic data typically captures only patient zip code; the crosswalk of zip code to county may contain errors.) Other fundamental differences Syndromic surveillance has been implemented locally and nationally as an early notification dataset focused on identifying pattern changes; but is typically not used as a measure of burden in a given period due to overarching quality (i.e., the system was designed for rapid surveillance, not for capturing or reporting historic burden).
Resources	**DC ESSENCE definition:** https://knowledgerepository.syndromicsurveillance.org/cdc-opioid-v3 **ESSENCE:** Burkom, H., Loschen, W., Wojcik, R., Holtry, R., Punjabi, M., Siwek, M., & Lewis, S. (2021). Electronic Surveillance System for the Early Notification of Community-Based Epidemics (ESSENCE): Overview, components, and public health applications. *JMIR Public Health Surveillance, 7*(6), e26303. https://doi.org/10.2196/26303

M 2.18: Number of individuals with new opioid prescriptions limited to a 7-day supply

Measure Description	Number of individuals aged 18+ who received a new opioid prescription for pain limited to a 7-day supply.
Background	Opioid prescriptions can be indicated for pain; however, there is an association between the initial opioid prescription duration and risk for OUD. To minimize this risk, many states have enacted laws limiting initial opioid prescriptions for acute pain to ≤7-day supply stemming from the 2016 U.S. CDC Guideline for Prescribing Opioids for Chronic Pain.
Data Sources	PDMP data **Kentucky:** Kentucky Cabinet for Health and Family Services, Office of Inspector General, Division of Audits and Investigations **Massachusetts:** Massachusetts Department of Public Health, Office of Prescription Monitoring and Drug Control **New York:** New York State Department of Health, Bureau of Narcotic Enforcement and New York State Department of Health, Office of Science **Ohio:** Ohio Board of Pharmacy
Measurement Periods	Month, quarter, calendar year, and HCS evaluation period (July 1, 2021–June 30, 2022)
Population	Number of unique individuals aged 18+ with one or more new opioid analgesic episodes in the measurement period, where a new episode is defined as a 45-day washout without an active opioid prescription.
Operational Definition	**Community Attribution:** Identify HCS communities by location of residence. See ***Appendix B*** for a further description of Community Attribution. 1. Select the opioid prescription fills identified in step N of ***Appendix B*** in which the patient is at least 17 years of age on the date of the fill. 2. From the table created in step 1, use the date filled and days supplied to calculate a run-out date (date of filled prescription + days supplied). 3. Compare the fill dates and run-out dates of each prescription. If one prescription completely overlaps a prescription with a shorter duration and an earlier run-out date (fill date B ≥ fill date A and run-out date B < run-out date A) then remove the prescription with the shorter duration. 4. Calculate the days between the run-out date of each filled prescription and the fill date of the subsequent prescription. This is the treatment gap. 5. Group consecutive prescriptions without a gap of >7 days as a period of continual treatment.

	6. In addition to the treatment gap defined in step 4, also fill in the treatment gap variable for the first opioid fill for each patient using the start date identified in step A of ***Appendix B***. Treatment gaps prior to each opioid fill can be considered a washout period. 7. Flag any opioid fill preceded by a washout period of ≥45 days as a new opioid episode. *Note: 45-day washout consistent with U.S. CDC Opioid Prescribing QI Measures.* 8. Select all unique combinations of patient ID, year, quarter, and month from the records flagged in step 7. 9. From the flagged months in step 8, delete any months prior to the month in which the patient turned 18 years of age. 10. Join the table created in step 9 with the table created in step F of ***Appendix B*** on patient ID, year, and month. 11. Join the table created in step 9 with the table created in step G of ***Appendix B*** on patient ID, year, and quarter. 12. Join the table created in step 9 with the table created in step H of ***Appendix B*** on patient ID and year. 13. Create monthly counts of unique patients by community from the table created in step 10, quarterly counts of unique patients by HCS community from the table created in step 11, and yearly counts of unique patients by HCS community from the table created in step 12. These counts are the denominators of measure 2.18. 14. From the table created in step 7, flag all instances where the days supplied on the first day of an episode is ≤7 days. 15. Select all unique combinations of patient ID, year, quarter, and month from the flagged records in step 14. 16. From the flagged months in step 15, delete any months prior to the month in which the patient turned 18 years of age. 17. Join the table created in step 16 with the table created in step F of ***Appendix B*** on patient ID, year, and month. 18. Join the table created in step 16 with the table created in step G of ***Appendix B*** on patient ID, year, and quarter. 19. Join the table created in step 16 with the table created in step H of ***Appendix B*** on patient ID and year. 20. Create monthly counts of unique patients by community from the table created in step 17, quarterly counts of unique patients by community from the table created in step 18, and yearly counts of unique patients by community from the table created in step 19. These counts are the numerators of measure 2.18.
Stratifications	For calendar year and evaluation period only. **Age:** 18–34, 35–54, 55+ years Create stratified annual counts using the age of each patient. Calculate this with the date of birth selected in Step E and the end date of each annual

	period (calendar year or evaluation period). An individual patient should not be counted in more than one age stratum in the same annual period. **Sex:** Male, female, missing Use the sex that appears on each patient's final record of the annual period (calendar year or evaluation period). An individual patient should not be counted in more than one sex stratum in the same annual period.
Limitations	Opioid products that are not likely to be used in the outpatient/ambulatory pharmacy setting—such as bulk powder, bulk chemicals, and dosage forms typically used in hospitals or hospice settings (e.g., epidurals, (intravenous) IVs)—are excluded. Products classified as cough/cold/allergy combinations, cough medications, antidiarrheal/probiotic agents, buprenorphine products used for OUD and pain, and methadone products used for OUD were also excluded.
Resources	Wolters Kluwer. (2020). Medi-Span Electronic Drug File (MED-File) v2. Dowell D, Haegerich TM, Chou R. CDC Guideline for Prescribing Opioids for Chronic Pain — United States, 2016. MMWR Recomm Rep 2016;65(No. RR-1):1–49. DOI: https://dx.doi.org/10.15585/mmwr.rr6501e1

M 2.19: Number of individuals screened for substance use (alcohol, drug use) (Medicaid)

Measure Description	Number of individuals enrolled in Medicaid aged 18-64 who were screened for alcohol and/or substance use.
Background	The U.S. Preventive Services Task Force recommends screening adults for unhealthy drug use to identify individuals with harmful levels of substance use and link them to effective treatment.
Data Sources	Administrative Medicaid claims data **Kentucky:** Kentucky Cabinet for Health and Family Services, Department for Medicaid Services **Massachusetts:** Massachusetts Executive Office of Health and Human Services **New York:** New York State Department of Health, Office of Health Insurance Programs **Ohio:** Ohio Department of Medicaid
Measurement Periods	Quarter, calendar year, and evaluation period
Population	Identify all Medicaid enrollees who were 18 to 64 years of age at any time during the measurement period (this does not include a 1-year lookback period) and who were not dual eligible (for Medicaid and Medicare) during the first month of the measurement period.

Operational Definition	1. Of individuals in the population, count unique individuals who had at least one claim during the measurement period indicating substance use screening. Any of the following procedure codes (Current Procedural Terminology/ Healthcare Common Procedure Coding System [CPT/HCPCS]) meet the criteria for substance use screening, and claims are not required to have a substance use disorder diagnosis to count: 99408 AUDIT/DAST 15-30 MIN 99409 AUDIT/DAST OVER 30 MIN H0001 Alcohol and/or drug assessment G0396 Alcohol and/or substance (other than tobacco) abuse structured assessment (e.g., AUDIT, DAST), and brief intervention 15 to 30 minutes G0397 Alcohol and/or substance (other than tobacco) abuse structured assessment (e.g., AUDIT, DAST), and brief intervention 15 to 30 minutes **Note**: This measure does not require continuous enrollment during the measurement period. **Community Attribution:** Identify HCS communities by location of residence. Use the most recent residence record from the population (12 months prior to measurement period, plus measurement period) to determine HCS community.
Stratifications	For calendar year and evaluation period only. **Age:** 18–34, 35–54, or 55–64 years, calculated as of last day of measurement period **Sex:** Male, female **Race/Ethnicity:** Hispanic, Non-Hispanic White, Non-Hispanic Black, Non-Hispanic Other, missing
Limitations	**Note:** Counts in Massachusetts communities are very low and unlikely to reflect true screening rates. This is likely due to the infrequent use of these codes even when screening occurs due to practice patterns and payment/billing practices.
Resources	US Preventive Services Task Force, Krist AH, Davidson KW, et al. Screening for Unhealthy Drug Use: US Preventive Services Task Force Recommendation Statement. JAMA. 2020;323(22):2301-2309. https://doi.org/10.1001/jama.2020.8020

3. Measure and Submeasures on Structural Aims that Can Impact the Secondary Outcomes and Reduce Opioid Overdose Mortality

M 3.1: Number of individuals with opioid prescriptions from multiple prescribers or pharmacies

Measure Description	Number of individuals aged 18+ who received opioid prescriptions from four or more prescribers or four or more pharmacies in a 3-month period.
Background	Individuals who receive opioid prescriptions from four or more prescribers or four or more pharmacies in a short time period have an increased risk of fatal and nonfatal opioid overdose (Rose et al., 2018).
Data Sources	PDMP data **Kentucky:** Kentucky Cabinet for Health and Family Services, Office of Inspector General, Division of Audits and Investigations **Massachusetts:** Massachusetts Department of Public Health, Office of Prescription Monitoring and Drug Control **New York:** New York State Department of Health, Bureau of Narcotic Enforcement and New York State Department of Health, Office of Science **Ohio**: Ohio Board of Pharmacy
Measurement Periods	Month, quarter, calendar year, and HCS evaluation period (July 1, 2021–June 30, 2022)
Population	This measure can be calculated as a rate using the following denominator: Population Submeasure P.1.1 (18+) or P.2.1 (18+). Please see the Population Measures section for details on calculation.
Operational Definition	For monthly measurement period, use the 3-month period ending in that month (e.g., the July 2018 measure examines prescriptions from May 2018 through July 2018). For quarterly or annual measurement periods, count the number of unique individuals qualifying for the monthly measure in one or more months of the measurement period. ***Appendix B*** contains detailed specifications for developing a PDMP analytic data set. 1. From the list of filled opioid prescriptions in step N of ***Appendix B***, select patient ID, date of fill, provider ID, and the pharmacy ID 2. Using the start date and end date defined in step A of Appendix B, create a table that includes the start date and end date of each moving quarter. Moving quarters are all possible groupings of three consecutive months throughout the study period (e.g. July 1–

	September 30, August 1–October 31, September 1–November 30, October 1–December 31). 3. Query the table from step 1 using the date ranges from the table in step 2 to create separate counts of unique pharmacy IDs and unique provider IDs for each patient in each moving quarter. 4. Flag records from step 3 where provider count ≥ 4 or pharmacy count ≥ 4. 5. From the table created in step 4, delete any months prior to the month in which each participant turned 18 years of age. 6. From the table created in 5, select the unique combinations for patient ID, year, and month where the 3.1 flag = 1; 7. From the table created in step 6, flag calendar quarters that include one or more months where the 3.1 flag = 1. 8. From the table created in step 7, flag calendar years that include one or more calendar quarters where the 3.1 flag = 1. 9. Join the table created in step 6 with the table created in step J of ***Appendix B*** on patient ID, year, and month. 10. Join the table created in step 7 with the table created in step K of ***Appendix B*** on patient ID, year, and quarter. 11. Join the table created in step 8 with the table created in step L of ***Appendix B*** on patient ID and year, creating separate counts for both calendar (January–December) and comparison (July–June) years. 12. Create monthly counts of unique patients by community from the table created in step 9, quarterly counts of unique patients by community from the table created in step 10, and yearly counts of unique patients by community from the table created in step 11. **Note:** This measure captures dispensed prescriptions with National Drug Code (NDC) numbers for opioid analgesic products. (For a description of how NDCs were included in the measures, please see ***Appendix C***.) The NDC list is updated quarterly by the HCS team using the Medi-Span Electronic Drug File (MED-File) v2 for active and inactive products (Wolters Kluwer, 2020). **Community Attribution:** Identify HCS communities by location of residence.
Stratifications	For calendar year and evaluation period only. **Age:** 18–34, 35–54, 55+ years Create stratified annual counts using the age of each patient. Calculate this with the date of birth selected in Step E and the end date of each annual period (calendar year or evaluation year). An individual patient should not be counted in more than one age stratum in the same annual period.

	Sex: Male, female, missing Use the sex that appears on each patient's final record of the annual period (calendar year or evaluation year). An individual patient should not be counted in more than one sex stratum in the same annual period.
Limitations	Opioid products that are not likely to be used in the outpatient/ambulatory pharmacy setting—such as bulk powder, bulk chemicals, and dosage forms typically used in hospitals or hospice settings (e.g., epidurals, (intravenous) IVs)—are excluded. Products classified as cough/cold/allergy combinations, cough medications, antidiarrheal/probiotic agents, buprenorphine products used for OUD and pain, and methadone products used for OUD were also excluded.
Resources	Rose, A. J., Bernson, D., Chui, K. K. H., Land, T., Walley, A. Y., LaRochelle, M. R., Stein, B. D., & Stopka, T. J. (2018). Potentially inappropriate opioid prescribing, overdose, and mortality in Massachusetts, 2011–2015. Journal of General Internal Medicine, 33, 1512–1519. https://doi.org/10.1007/s11606-018-4532-5 Wolters Kluwer (2020). Medi-Span Electronic Drug File (MED-File) v2.

M 3.2: Number of providers with DATA 2000 waiver

Measure Description	Number of providers with a Drug Addiction Treatment Act of 2000 (DATA 2000) waiver to prescribe and dispense buprenorphine.
Background	Increasing the number of providers with a DATA 2000 waiver is a structural aim that would increase treatment capacity, which then could decrease opioid overdose fatalities and affect secondary measures such as increasing the number of individuals with OUD receiving for MOUD and reducing the number of overdose events (if the capacity is utilized).
Data Sources	U.S. Drug Enforcement Administration (DEA) data
Measurement Periods	Month, quarter, calendar year, and HCS evaluation period (July 1, 2021–June 30, 2022)
Population	This measure can be calculated as a rate using the following denominator: Population Submeasure P.1.1 (18+) or P.2.1 (18+). Please see the Population Measures section for details on calculation.
Operational Definition	Number of providers with a DATA 2000 waiver to prescribe buprenorphine for OUD treatment 1. Create operational definition for *each measurement interval.* Prescribers in the monthly DEA file extracts represent Active Controlled Substances Act (CSA) Registrants Database (i.e., authorized to handle controlled substances for that month). a. Create a sub-set of these prescribers to represent the practitioners who have received a DATA 2000 waiver to provide office-based

opioid treatment in your state by selecting only records with the following Business Activity Code and Sub-codes:

Civilian physicians: C1, C4, CB, and CK

AND

Civilian nurse practitioners: MF, MH, MK, and MQ

AND

Civilian physician assistants: MG, MI, ML, and MR

AND

Civilian assistant physicians: MM, MN, MP, and MS

Note: There should be no duplicated record because each practitioner can have only one DATA 2000 waiver number nationally.

b. Determine whether each DATA 2000–waived prescriber is registered in an HCS community using city/zip code of the prescriber's address.

Note: In Ohio, many zip codes cross counties, so the provider addresses are geocoded and assigned to a county.

c. For each HCS community, identify the active DATA 2000–waived providers in the given month. Calculate the number of active DATA 2000–waived providers in each HCS community in the given month.

2. Create operational definition for quarterly and/or annual measures.

Note: Providers whose registration changes from one HCS community to another HCS community in a measurement period should be counted in both HCS communities for the measurement period.

3. For each HCS community and each calendar month of the measurement period, identify the DATA 2000–waived prescribers following the algorithm for the calculation of the operational definition for the monthly measure.
4. For each HCS community, join the list of DATA 2000–waived providers for each month in the measurement period.
5. For each HCS community, calculate the number of unique DATA 2000–waived prescribers who were allowed to provide office-based opioid treatment at some point during the measurement period.

Rate: The number of providers with a DATA 2000 waiver can be presented per population of 100,000 residents.

Additional Submeasures (based on the highest level of prescribing a provider had during the measurement period):

Note: Providers whose registration changes from one HCS community to another HCS community in a measurement period and change their patient limit during the same measurement period should be counted in both HCS

	communities at their highest level of prescribing for the measurement period. **M 3.2.30: Number of providers with DATA 2000 waiver with 30-patient limit** Business Activity Code and Sub-codes: C1 (practitioner DW/30), MF (MLP-Nurse Practitioner DW/30), MG (Physician Assistant DW/30), CK (Practitioner-DW/30SW), MQ (MLP-Nurse Practitioner-DW/30SW), MR (MLP-Physician Assistant-DW/30SW) **M 3.2.100: Number of providers with DATA 2000 waiver with 100-patient limit** Business Activity Code and Sub-codes: C4 (practitioner DW/100), MH (MLP-Nurse Practitioner DW/100), MI (Physician Assistant DW/100) **M 3.2.275: Number of providers with DATA 2000 waiver with 275-patient limit** Business Activity Code and Sub-codes: CB (practitioner DW/275), MK (MLP-Nurse Practitioner DW/275), ML (Physician Assistant DW/275) **Note**: This measure does not require continuous enrollment during the measurement period.
Stratifications	N/A
Limitations	This measure places provider within the community based on their practice address and will therefore exclude providers who prescribe to the community but are not registered with the DEA at an address within the community.

M 3.3: Number of providers with DATA 2000 waiver who actively prescribed buprenorphine for treatment of OUD

Measure Description	Number of providers with a Drug Addiction Treatment Act of 2000 (DATA 2000) waiver who actively prescribed buprenorphine products that are FDA approved for the treatment of OUD.
Background	Increasing the number of providers with a DATA 2000 waiver that actively prescribe buprenorphine is a structural aim that would increase treatment capacity, which then could decrease opioid overdose fatalities and affect secondary measures such as increasing the number of individuals with OUD receiving medication for opioid use disorder and reducing the number of overdose events (if the capacity is utilized).
Data Sources	PDMP data U.S. Drug Enforcement Administration (DEA) data **Kentucky:** Kentucky Cabinet for Health and Family Services, Office of Inspector General, Division of Audits and Investigations

	Massachusetts: Massachusetts Department of Public Health, Office of Prescription Monitoring and Drug Control **New York:** New York State Department of Health, Bureau of Narcotic Enforcement and New York State Department of Health, Office of Science **Ohio:** Ohio Board of Pharmacy
Measurement Periods	Month, quarter, calendar year, and HCS evaluation period (July 1, 2021–June 30, 2022)
Population	Number of providers with DATA 2000 waiver registered with the DEA at an address within an HCS community (Operational definition for Measures 3.2, 3.2.30, 3.2.100, and 3.2.275)
Operational Definition	Merge DEA data for waivered clinicians in each HCS community with PDMP data for prescriptions of buprenorphine products that are approved by the FDA for the treatment of OUD by National Drug Code (NDC) (see ***Appendix C***). Count the number of providers who have written one or more buprenorphine prescriptions during the measurement period. Create Submeasures based on waiver limit: **M 3.3.30: Providers with a waiver limit of 30 patients** **M 3.3.100: Providers with a waiver limit of 100 patients** **M 3.3.275: Providers with a waiver limit of 275 patients** **Community Attribution**: Identify HCS communities by registered DEA practice address.
Stratifications	N/A
Limitations	This measure places provider within the community based on their practice address and will therefore exclude providers who prescribe to the community but are not registered with the DEA at an address within the community.
Resources	Wolters Kluwer (2020). Medi-Span Electronic Drug File (MED-File) v2.

M 3.4: Number of providers who actively prescribed buprenorphine for treatment of OUD

Measure Description	Number of providers who actively prescribed buprenorphine products that are FDA-approved for the treatment of OUD.

Background	The Consolidated Appropriations Act of 2023 removed the Drug Addiction Treatment Act of 2000 (DATA 2000) waiver requirement for providers to prescribe buprenorphine for the treatment of OUD. With this change in December 2022, all providers who have a current U.S. Drug Enforcement Administration (DEA) registration that includes Schedule III authority, may now prescribe buprenorphine for OUD. This measure monitors a structural aim to increase treatment capacity, which then could decrease opioid overdose fatalities and affect secondary measures such as increasing the number of individuals with OUD receiving medication for opioid use disorder and reducing the number of opioid overdose events (if the capacity is utilized). This measure captures dispensed prescriptions with National Drug Code (NDC) numbers for buprenorphine products that are approved by the FDA for the treatment of OUD. (For a description of how NDCs were included in the measures, please see ***Appendix C***.) The NDC list is updated quarterly by the HCS team using the Medi-Span Electronic Drug File (MED-File) v2 for active and inactive products (Wolters Kluwer, 2020). Buprenorphine products directly purchased for administration in practitioner offices (i.e., products that are not first dispensed by pharmacies) are not captured in PDMP data. Transdermal, parenteral, and buccal formulations of buprenorphine approved for treatment of pain are excluded.
Data Sources	PDMP data **Kentucky:** Kentucky Cabinet for Health and Family Services, Office of Inspector General, Division of Audits and Investigations **Massachusetts:** Massachusetts Department of Public Health, Office of Prescription Monitoring and Drug Control **New York:** New York State Department of Health, Bureau of Narcotic Enforcement and New York State Department of Health, Office of Science **Ohio:** Ohio Board of Pharmacy
Measurement Periods	Month, quarter, calendar year, and HCS evaluation period (July 1, 2021–June 30, 2022)
Population	This measure can be calculated as a rate using the following denominator: Population Submeasure P.1.1 (18+) or P.2.1 (18+). Please see the Population Measures section for details on calculation.
Operational Definition	1. Start with M 2.5.1 (the number of unique individuals aged 18+ who received MOUD containing buprenorphine) for the measurement period. 2. Count the number of unique providers who have written one or more buprenorphine prescriptions to those individuals during the measurement period (based on the date the prescription was filled). **Community Attribution**: Identify HCS communities by location of patient residence.
Stratifications	N/A

Limitations	Buprenorphine products directly purchased for administration in practitioner offices (i.e., products that are not first dispensed by pharmacies) are not captured in PDMP data.
Resources	Wolters Kluwer. (2020). Medi-Span Electronic Drug File (MED-File) v2.

M 3.8: Number of drug take back drop boxes

Measure Description	Number of U.S. Drug Enforcement Administration (DEA) authorized drug take back drop boxes.
Background	Drug take back drop boxes are the best way to safely dispose of unused or expired prescription and nonprescription medicines. Authorized collection points safely and securely gather and dispose of unused or expired medications, including those with controlled substances. These sites could include retail, hospital, or clinic pharmacies, as well as law enforcement facilities. This measure will be the count of locations providing drug take-back services collected from the DEA website and supplemented by state-specific data sources.
Data Sources	DEA data (https://apps2.deadiversion.usdoj.gov/pubdispsearch/spring/main?execution=e2s1) **Kentucky:** law enforcement data (https://odcp.ky.gov/Pages/Prescription-Drug-Disposal-Locations.aspx) **Massachusetts:** law enforcement–related drop box data (https://www.mass.gov/info-details/find-a-waste-medication-kiosk) **New York:** law enforcement data (https://health.ny.gov/professionals/narcotic/drug_take_back.htm; https://www.arcgis.com/home/webmap/viewer.html?webmap=58175eea143d45b699296b2a63c74bd5&extent=-81.9219,39.4623,-68.9801,46.0128) **Ohio:** law enforcement–related drop box data (https://www.rxdrugdropbox.org/loc/ohio/; https://www.ohioattorneygeneral.gov/Individuals-and-Families/Victims/Drug-Abuse-Resources) (removed in early 2023)
Measurement Periods	Semi-annual (approximately January and July). The data point for July 2022 will be used for analysis. This will be the comparison point.
Population	This measure can be calculated as a rate using the following denominator: Population Submeasure P.1.1 (18+) or P.2.1 (18+). Please see the Population Measures section for details on calculation.
Operational Definition	These websites should be queried in January and July. Once sources are joined, they should be sorted into the individual HCS communities using zip code lists or other geocoding methods.

Stratifications	N/A
Limitations	Ohio: July 2020 data is not consistent with subsequent time points. The initial (July 2020 time point) list was obtained from a local DEA contact in October 2020. Beginning in January 2021, Ohio scraped data from the following websites in January/July: https://www.ohioattorneygeneral.gov/Individuals-and-Families/Victims/Drug-Abuse-Resources (removed following January 2023 data pull) https://apps.deadiversion.usdoj.gov/pubdispsearch/spring/main?execution=e1s1 https://www.rxdrugdropbox.org/loc/ohio/

4. Measures and Submeasures Supporting Health Economics Studies on Incremental Cost, Cost Effectiveness, Economic Modeling, and Sustainability

M 4.1.1: Number of emergency department visits for drug overdose or mental/behavioral disorders (Medicaid)

Measure Description	Number of unique emergency department (ED) visits that were primarily behavioral health (BH) related among individuals enrolled in Medicaid aged 18-64.
Background	This measure helps to establish Medicaid service utilization and costs associated with the Communities That HEAL (CTH) intervention. ED visits are high-cost health care events that may be impacted by the CTH intervention. BH and non-BH ED visits may have a different cost on average.
Data Sources	Administrative Medicaid claims data **Kentucky:** Kentucky Cabinet for Health and Family Services, Department for Medicaid Services **Massachusetts:** Massachusetts Executive Office of Health and Human Services **New York:** New York State Department of Health, Office of Health Insurance Programs **Ohio:** Ohio Department of Medicaid
Measurement Periods	Month, calendar year (2019 only), HCS evaluation period (July 1, 2021–June 30, 2022), and comparison years before and after the evaluation period (July 1–June 30)
Population	Medicaid enrollees who were aged 18-64 years at some point during the measurement period and were not dual eligible (for Medicaid and Medicare) during the first month of the measurement period. The population is divided into four mutually exclusive subgroups: 1. Number of individuals with OUD in measurement period OR in 12 months prior; 2. Number of individuals who received MOUD in measurement period OR in 12 months prior **(excluding subgroup 1)**; 3. Number of individuals who received opioid pain medication prescription fills in the measurement period OR in 12 months prior **(excluding subgroups 1 and 2)**; 4. All other individuals **(excluding subgroups 1, 2, and 3)** Note: See ***Appendix G*** for more detail.

Operational Definition	1. Across all individuals in the population, count the number of unique ED visits where there is a primary or first-listed (if no primary) BH diagnosis (ICD-10-CM ranges F01–F69, F90–F99) or any listed overdose code (ICD-10-CM range T36–T50: Overdose by drugs, medicaments and biological substances listed). (For ICD-10-CM Diagnosis Codes, Procedure Codes, and descriptions, please see https://icd10cmtool.cdc.gov/?fy=FY2021.) Primary or first-listed (if primary diagnosis not available) BH diagnosis: F01–F69, F90–F99 OR Any listed overdose by drugs, medicaments and biological substances listed: T36–T50 2. Codes to identify ED records: Either Current Procedural Terminology (CPT) code of 99281–99285, 99288 OR Revenue Code of 450–452, 456, 459, 981 OR Place of Service Code of 23 3. Strategy to identify unique ED visits: Use claim ID number and transaction control number to identify line items that are part of the same ED visit. **Community Attribution:** Identify HCS communities by location of residence. Use the most recent residence record from the measurement period to determine the HCS community.
Stratifications	For calendar year 2019, evaluation period (July 1, 2021–June 30, 2022), and comparison years (July 1–June 30). **Age:** 18–34, 35–54, 55–64 years, as of first day of measurement period **Sex:** Male, female **Race/Ethnicity:** Hispanic; non-Hispanic White; non-Hispanic Black; non-Hispanic Other; missing
Limitations	N/A

M 4.1.2: Number of emergency department visits NOT related to drug overdose or mental/behavioral disorders (Medicaid)

Measure Description	Number of unique emergency department visits that were primarily non-behavioral health (non-BH) related among individuals enrolled in Medicaid aged 18-64.
Background	This measure helps to establish Medicaid service utilization and costs associated with the Communities That HEAL (CTH) intervention. Emergency department (ED) visits are high-cost health care events that may be impacted by the CTH intervention. BH and non-BH ED visits may have a different cost on average.
Data Sources	Administrative Medicaid claims data **Kentucky:** Kentucky Cabinet for Health and Family Services, Department for Medicaid Services **Massachusetts:** Massachusetts Executive Office of Health and Human Services **New York:** New York State Department of Health, Office of Health Insurance Programs **Ohio:** Ohio Department of Medicaid
Measurement Periods	Month, calendar year (2019 only), HCS evaluation period (July 1, 2021–June 30, 2022), and comparison years before and after the evaluation period (July 1–June 30)
Population	Medicaid enrollees who were aged 18-64 years at some point during the measurement period and were not dual eligible (for Medicaid and Medicare) during the first month of the measurement period. The population is divided into four mutually exclusive subgroups: 1. Number of individuals with OUD in measurement period OR in 12 months prior; 2. Number of individuals who received MOUD in measurement period OR in 12 months prior **(excluding subgroup 1)**; 3. Number of individuals who received opioid pain medication prescription fill in measurement period OR in 12 months prior **(excluding subgroups 1 and 2)**; 4. All other individuals **(excluding subgroups 1, 2, and 3)** Note: See ***Appendix G*** for more detail.
Operational Definition	1. Across all individuals in the population, count the number of unique ED visits where there is NOT a primary or first-listed (if primary diagnosis not available) behavioral health diagnosis (ICD-10-CM ranges F01–F69, F90–F99) and NOT an any listed overdose code (ICD-10-CM range T36–T50: Overdose by drugs, medicaments and biological substances

	listed). (For ICD-10-CM Diagnosis Codes, Procedure Codes, and descriptions, please see https://icd10cmtool.cdc.gov/?fy=FY2021.) Not Primary or first-listed (if primary diagnosis not available) BH diagnosis: F01–F69, F90–F99 And not Any listed overdose by drugs, medicaments and biological substances listed: T36–T50 2. Codes to identify ED records: Either Procedure Code of 99281 99282 99283 99284 99285 99288 OR Revenue Code of 450 451 452 456 459 981 OR Place of Service Code of 23 3. Strategy to identify unique ED visits: Use claim ID number and transaction control number to identify line items that are part of the same ED visit. **Community Attribution:** Identify HCS communities by location of residence. Use the most recent residence record from the measurement period to determine the HCS community.
Stratifications	For calendar year 2019, evaluation period (July 1, 2021–June 30, 2022), and comparison years (July 1–June 30). **Age:** 18–34, 35–54, 55–64 years, as of first day of measurement period

	Sex: Male, female **Race/Ethnicity:** Hispanic; non-Hispanic White; non-Hispanic Black; non-Hispanic Other; missing
Limitations	N/A

M 4.2.1: Number of hospital inpatient nights for drug overdose or mental/behavioral disorders excluding detoxification (Medicaid)

Measure Description	Number of hospital inpatient nights that were primarily behavioral health (BH) related (excluding detoxification) among individuals enrolled in Medicaid aged 18-64.
Background	This measure helps to establish Medicaid service utilization and costs associated with the Communities That HEAL (CTH) intervention. Hospital inpatient stays are high-cost health care events that may be impacted by the CTH intervention. Inpatient nights that are primarily BH related may have a different cost on average compared to non-BH and detoxification nights.
Data Sources	Administrative Medicaid claims data **Kentucky:** Kentucky Cabinet for Health and Family Services, Department for Medicaid Services **Massachusetts:** Massachusetts Executive Office of Health and Human Services **New York:** New York State Department of Health, Office of Health Insurance Programs **Ohio:** Ohio Department of Medicaid
Measurement Periods	Month, calendar year (2019 only), HCS evaluation period (July 1, 2021–June 30, 2022), and comparison years before and after the evaluation period (July 1–June 30)
Population	Medicaid enrollees who were aged 18-64 years at some point during the measurement period and were not dual eligible (for Medicaid and Medicare) during the first month of the measurement period. The population is divided into four mutually exclusive subgroups: 1. Number of individuals with OUD in measurement period OR in 12 months prior; 2. Number of individuals who received MOUD in measurement period OR in 12 months prior **(excluding subgroup 1)**; 3. Number of individuals who received opioid pain medication prescription fill in measurement period OR in 12 months prior **(excluding subgroups 1 and 2)**; 4. All other individuals **(excluding subgroups 1, 2, and 3)** Note: See ***Appendix G*** for more detail.

Operational Definition	1. Across all individuals in the population, count the number of inpatient nights, across all inpatient stays, where there is either a primary behavioral health diagnosis (ICD-10-CM ranges F01–F69, F90–F99) or there is a secondary overdose code (ICD-10-CM range T36–T50: Overdose by drugs, medicaments and biological substances listed) and there is not a detox code. (For ICD-10-CM Diagnosis Codes, Procedure Codes, and descriptions, please see https://icd10cmtool.cdc.gov/?fy=FY2021.) Primary BH diagnosis: F01–F69; F90–F99 (primary diagnosis code) OR Any listed overdose by drugs, medicaments and biological substances listed: T36–T50 (secondary diagnosis code) And not Revenue Code of 116, 126, 136, 146, 156 And not ICD-10-PCS code HZ2ZZZZ, Healthcare Common Procedure Coding System (HCPCS) code H0009 2. Code to identify inpatient records If available, use claim type = “I” If not available, use revenue code 100–219 (exclude 116, 126, 136, 146, 156) 3. Identify unique inpatient stays (where there may be multiple service records). Within individuals’ service utilization, if there is ≤ 1 day gap between inpatient stays and the provider is the same, they are part of the same unique inpatient stay. Single record: Number of nights is equal to the discharge date minus the admission date. Multiple records: Number of nights is equal to the last record’s discharge date minus the first record’s admission date. Diagnosis, revenue, and procedure codes to use when there are multiple service records. Where there are multiple service records, use diagnosis, revenue, and procedure codes from the first record. 4. Attribution of inpatient stays to relevant month and year All nights for an inpatient stay should be attributed to the month and year of the admission date. This rule applies even when inpatient stays extend over multiple months or years.

	Community Attribution: Identify HCS communities by location of residence. Use the most recent residence record from the measurement period to determine the HCS community.
Stratifications	For calendar year 2019, evaluation period (July 1, 2021–June 30, 2022), and comparison years (July 1–June 30). **Age:** 18–34, 35–54, 55–64 years, as of first day of measurement period **Sex:** Male, female **Race/Ethnicity:** Hispanic; non-Hispanic White; non-Hispanic Black; non-Hispanic Other; missing
Limitations	N/A

M 4.2.2: Number of hospital inpatient nights for detoxification (Medicaid)

Measure Description	Number of hospital inpatient nights that were primarily for detoxification among individuals enrolled in Medicaid aged 18-64.
Background	This measure helps to establish Medicaid service utilization and costs associated with the Communities That HEAL (CTH) intervention. Hospital inpatient stays are high-cost health care events that may be impacted by the CTH intervention. Inpatient nights that are primarily for detoxication may have a different cost on average compared to other inpatient nights.
Data Sources	Administrative Medicaid claims data **Kentucky:** Kentucky Cabinet for Health and Family Services, Department for Medicaid Services **Massachusetts:** Massachusetts Executive Office of Health and Human Services **New York:** New York State Department of Health, Office of Health Insurance Programs **Ohio:** Ohio Department of Medicaid
Measurement Periods	Month, calendar year (2019 only), HCS evaluation period (July 1, 2021–June 30, 2022), and comparison years before and after the evaluation period (July 1–June 30)
Population	Medicaid enrollees who were aged 18-64 years at some point during the measurement period and were not dual eligible (for Medicaid and Medicare) during the first month of the measurement period. The population is divided into four mutually exclusive subgroups: 1. Number of individuals with OUD in measurement period OR in 12 months prior; 2. Number of individuals who received MOUD in measurement period OR in 12 months prior **(excluding subgroup 1)**;

	3. Number of individuals who received opioid pain medication prescription fill in measurement period OR in 12 months prior **(excluding subgroups 1 and 2)**; 4. All other individuals **(excluding subgroups 1, 2, and 3)** Note: See ***Appendix G*** for more detail.
Operational Definition	1. Across all individuals in the population, count the number of inpatient nights, across all inpatient stays, where there is a detox code of the following: Revenue Code of 116 126 136 146 156 OR ICD-10-PCS code HZ2ZZZZ (may be an Ohio-specific code), H0009 2. Code to identify inpatient records If available, use claim type = "I" If not available, use revenue code 100–219 3. Identify unique inpatient stays (where there may be multiple service records). Within individuals' service utilization, if there is ≤1 day gap between inpatient stays and the provider is the same, they are part of the same unique inpatient stay. 4. Calculate number of nights. Number of nights is equal to the discharge date minus the admission date. Where there are multiple service records, Number of nights is equal to the last record's discharge date minus the first record's admission date. 5. Where there are multiple service records, use diagnosis, revenue, and procedure codes from the first record. 6. Attribution of inpatient stays to relevant month and year All nights for an inpatient stay should be attributed to the month and year of the admission date. This rule applies even when inpatient stays extend over multiple months or years.

	Community Attribution: Identify HCS communities by location of residence. Use the most recent residence record from the measurement period to determine the HCS community.
Stratifications	For calendar year 2019, evaluation period (July 1, 2021–June 30, 2022), and comparison years (July 1–June 30). **Age:** 18–34, 35–54, 55–64 years, as of first day of measurement period **Sex:** Male, female **Race/Ethnicity:** Hispanic; non-Hispanic White; non-Hispanic Black; non-Hispanic Other; missing
Limitations	N/A

M 4.2.3: Number of hospital inpatient nights NOT for drug overdose or mental/behavioral disorders or detoxification (Medicaid)

Measure Description	Number of hospital/inpatient nights that were primarily non-behavioral health (non-BH) related among individuals enrolled in Medicaid aged 18-64.
Background	This measure helps to establish Medicaid service utilization and costs associated with the Communities That HEAL (CTH) intervention. Hospital inpatient stays are high-cost health care events that may be impacted by the CTH intervention. Inpatient nights that are primarily non-BH related may have a different cost on average compared to BH and detoxification nights.
Data Sources	Administrative Medicaid claims data **Kentucky:** Kentucky Cabinet for Health and Family Services, Department for Medicaid Services **Massachusetts:** Massachusetts Executive Office of Health and Human Services **New York:** New York State Department of Health, Office of Health Insurance Programs **Ohio:** Ohio Department of Medicaid
Measurement Periods	Month, calendar year (2019 only), HCS evaluation period (July 1, 2021–June 30, 2022), and comparison years before and after the evaluation period (July 1–June 30)
Population	Medicaid enrollees who were aged 18-64 years at some point during the measurement period and were not dual eligible (for Medicaid and Medicare) during the first month of the measurement period. The population is divided into four mutually exclusive subgroups: 1. Number of individuals with OUD in measurement period OR in 12 months prior; 2. Number of individuals who received MOUD in measurement period OR in 12 months prior **(excluding subgroup 1)**;

	3. Number of individuals who received opioid pain medication prescription fill in measurement period OR in 12 months prior **(excluding subgroups 1 and 2)**; 4. All other individuals **(excluding subgroups 1, 2, and 3)** Note: See ***Appendix G*** for more detail.
Operational Definition	1. Across all individuals in the population, count the number of inpatient nights, across all inpatient stays, where there is not a primary behavioral health diagnosis (ICD-10-CM ranges F01–F69, F90–F99) nor is there is a secondary overdose code (ICD-10-CM range T36–T50: Overdose by drugs, medicaments and biological substances listed), nor is there a detox code. (For ICD-10-CM Diagnosis Codes, Procedure Codes, and descriptions, please see https://icd10cmtool.cdc.gov/?fy=FY2021.) Not Primary BH diagnosis: F01–F69; F90–F99 (primary diagnosis code) And not Any listed overdose by drugs, medicaments and biological substances listed: T36–T50 (secondary diagnosis code) And not Revenue code: 116, 126, 136, 146, 156 And not ICD-10-PCS code HZ2ZZZZ, H0009 **Community Attribution:** Identify HCS communities by location of residence. Use the most recent residence record from the measurement period to determine the HCS community. 2. Code to identify inpatient records If available, use claim type = "I" If not available, use revenue code 100–219, excluding 116, 126, 136, 146, 156 3. How to identify unique inpatient stays (where there may be multiple service records) Within individuals' service utilization, if there is ≤1 day gap between inpatient stays and the provider is the same, they are part of the same unique inpatient stay. 4. Calculating number of nights Number of nights is equal to the discharge date minus the admission date Where there are multiple service records, Number of nights is equal to the last record's discharge date minus the first record's admission date.

	5. Diagnosis, revenue, and procedure codes to use when there are multiple service records Where there are multiple service records, use diagnosis, revenue, and procedure codes from the first record. 6. Attribution of inpatient stays to relevant month and year All nights for an inpatient stay should be attributed to the month and year of the admission date. This rule applies even when inpatient stays extend over multiple months or years.
Stratifications	For calendar year 2019, evaluation period (July 1, 2021–June 30, 2022), and comparison years (July 1–June 30). **Age:** 18–34, 35–54, 55–64 years, as of first day of measurement period **Sex:** Male, female **Race/Ethnicity:** Hispanic; non-Hispanic White; non-Hispanic Black; non-Hispanic Other; missing
Limitations	N/A

M 4.3.1: Number of nights at a residential treatment center NOT involving detoxification (Medicaid)

Measure Description	Number of residential nights that were NOT for detoxification among individuals enrolled in Medicaid aged 18-64.
Background	This measure helps to establish Medicaid service utilization and costs associated with the Communities That HEAL (CTH) intervention. Residential services are high-cost health care events that may be impacted by the CTH intervention. Residential nights that were primarily for detoxification may have different costs on average compared to non-detoxification nights.
Data Sources	Administrative Medicaid claims data **Kentucky:** Kentucky Cabinet for Health and Family Services, Department for Medicaid Services **Massachusetts:** Massachusetts Executive Office of Health and Human Services **New York:** New York State Department of Health, Office of Health Insurance Programs **Ohio:** Ohio Department of Medicaid
Measurement Periods	Month, calendar year (2019 only), HCS evaluation period (July 1, 2021–June 30, 2022), and comparison years before and after the evaluation period (July 1–June 30)

Population	Medicaid enrollees who were aged 18-64 years at some point during the measurement period and were not dual eligible (for Medicaid and Medicare) during the first month of the measurement period. The population is divided into four mutually exclusive subgroups: 1. Number of individuals with OUD in measurement period OR in 12 months prior; 2. Number of individuals who received MOUD in measurement period OR in 12 months prior **(excluding subgroup 1)**; 3. Number of individuals who received opioid pain medication prescription fill in measurement period OR in 12 months prior **(excluding subgroups 1 and 2)**; 4. All other individuals **(excluding subgroups 1, 2, and 3)** **Note: See *Appendix G* for more detail.**
Operational Definition	1. Across all individuals in the population, count the number of behavioral health residential nights. Contains either Place of Service code: 55, 56 OR Procedure Code: H0017, H0018, H0019, H2034, H2036 OR Revenue Code: 1001, 1002 And not Procedure Code: H0010, H0011 2. Attribution of residential stays to relevant month and year All nights for a residential stay should be attributed to the month and year of the admission date This rule applies even when residential stays extend over multiple months or years. A one-day gap between residential nights is not considered to be a discontinuation or a break in the residential stay; one-day gaps should be included in the count of residential nights. A gap of 2 or more days is considered a discontinuation or break in a residential stay and should not be counted in the sum of residential nights. **Community Attribution:** Identify HCS communities by location of residence. Use the most recent residence record from the measurement period to determine the HCS community.
Stratifications	For calendar year 2019, evaluation period (July 1, 2021–June 30, 2022), and comparison years (July 1–June 30). **Age:** 18–34, 35–54, 55–64 years, as of first day of measurement period **Sex:** Male, female

	Race/Ethnicity: Hispanic; non-Hispanic White; non-Hispanic Black; non-Hispanic Other; missing
Limitations	N/A

M 4.3.2: Number of nights at a residential treatment center for detoxification (Medicaid)

Measure Description	Number of residential nights that were for detoxication among individuals enrolled in Medicaid aged 18-64.
Background	This measure helps to establish Medicaid service utilization and costs associated with the Communities That HEAL (CTH) intervention. Residential services are high-cost health care events that may be impacted by the CTH intervention. Residential nights that were primarily for detoxification may have different costs on average compared to non-detoxification nights.
Data Sources	Administrative Medicaid claims data **Kentucky:** Kentucky Cabinet for Health and Family Services, Department for Medicaid Services **Massachusetts:** Massachusetts Executive Office of Health and Human Services **New York:** New York State Department of Health, Office of Health Insurance Programs **Ohio:** Ohio Department of Medicaid
Measurement Periods	Month, calendar year (2019 only), HCS evaluation period (July 1, 2021–June 30, 2022), and comparison years before and after the evaluation period (July 1–June 30)
Population	Medicaid enrollees who were aged 18-64 years at some point during the measurement period and were not dual eligible (for Medicaid and Medicare) during the first month of the measurement period. The population is divided into four mutually exclusive subgroups: 1. Number of individuals with OUD in measurement period OR in 12 months prior; 2. Number of individuals who received MOUD in measurement period OR in 12 months prior **(excluding subgroup 1)**; 3. Number of individuals who received opioid pain medication prescription fill in measurement period OR in 12 months prior **(excluding subgroups 1 and 2)**; 4. All other individuals **(excluding subgroups 1, 2, and 3)** Note: See ***Appendix G*** for more detail.
Operational Definition	1. Across all individuals in the population, count the number of behavioral health residential detox nights.

	Healthcare Common Procedure Coding System (HCPCS)codes: H0010, H0011 2. Attribution of residential stays to relevant month and year All nights for a residential stay should be attributed to the month and year of the admission date. This rule applies even when residential stays extend over multiple months or years. A one-day gap between residential nights is not considered to be a discontinuation or a break in the residential stay; one-day gaps should be included in the count of residential nights. A gap of 2 or more days is considered a discontinuation or break in a residential stay and should not be counted in the sum of residential nights. **Community Attribution:** Identify HCS communities by location of residence. Use the most recent residence record from the measurement period to determine the HCS community.
Stratifications	For calendar year 2019, evaluation period (July 1, 2021–June 30, 2022), and comparison years (July 1–June 30). **Age:** 18–34, 35–54, 55–64 years, as of first day of measurement period **Sex:** Male, female **Race/Ethnicity:** Hispanic; non-Hispanic White; non-Hispanic Black; non-Hispanic Other; missing
Limitations	N/A

M 4.4.1: Number of intensive outpatient visits for behavioral health treatment (Medicaid)

Measure Description	Number of intensive outpatient visits among individuals enrolled in Medicaid aged 18-64.
Background	This measure helps to establish Medicaid service utilization and costs associated with the Communities That HEAL (CTH) intervention. Intensive outpatient visits may be impacted by the CTH intervention. Intensive outpatient visits by nature are assumed to be behavioral health related. Intensive outpatient visits have different costs on average compared to other outpatient visits.
Data Sources	Administrative Medicaid claims data **Kentucky:** Kentucky Cabinet for Health and Family Services, Department for Medicaid Services **Massachusetts:** Massachusetts Executive Office of Health and Human Services **New York:** New York State Department of Health, Office of Health Insurance Programs

	Ohio: Ohio Department of Medicaid
Measurement Periods	Month, calendar year (2019 only), HCS evaluation period (July 1, 2021–June 30, 2022), and comparison years before and after the evaluation period (July 1–June 30)
Population	Medicaid enrollees who were aged 18-64 years at some point during the measurement period and were not dual eligible (for Medicaid and Medicare) during the first month of the measurement period. The population is divided into four mutually exclusive subgroups: 1. Number of individuals with OUD in measurement period OR in 12 months prior; 2. Number of individuals who received MOUD in measurement period OR in 12 months prior **(excluding subgroup 1)**; 3. Number of individuals who received opioid pain medication prescription fill in measurement period OR in 12 months prior **(excluding subgroups 1 and 2)**; 4. All other individuals **(excluding subgroups 1, 2, and 3)** Note: See ***Appendix G*** for more detail.
Operational Definition	1. Across all individuals in the population, count the number of intensive outpatient visits. Contain either Revenue codes: 905–907, 912, 913 OR Healthcare Common Procedure Coding System (HCPCS) codes: H0015, H0035, S9480, S0201 2. Strategy to identify unique intensive outpatient program visits: Use claim ID number and transaction control number to identify line items that are part of the same intensive outpatient visit. **Community Attribution:** Identify HCS communities by location of residence. Use the most recent residence record from the measurement period to determine the HCS community.
Stratifications	For calendar year 2019, evaluation period (July 1, 2021–June 30, 2022), and comparison years (July 1–June 30). **Age:** 18–34, 35–54, 55–64 years, as of first day of measurement period **Sex:** Male, female **Race/Ethnicity:** Hispanic; non-Hispanic White; non-Hispanic Black; non-Hispanic Other; missing
Limitations	N/A

M 4.5.1: Number of outpatient visits for mental/behavioral disorders (Medicaid)

Measure Description	Number of outpatient visits that were behavioral health (BH) related among individuals enrolled in Medicaid aged 18-64.
Background	This measure helps to establish Medicaid service utilization and costs associated with the Communities That HEAL (CTH) intervention. Outpatient visits may be impacted by the CTH intervention. BH related outpatient visits have different costs on average compared to non-BH outpatient visits.
Data Sources	Administrative Medicaid claims data **Kentucky:** Kentucky Cabinet for Health and Family Services, Department for Medicaid Services **Massachusetts:** Massachusetts Executive Office of Health and Human Services **New York:** New York State Department of Health, Office of Health Insurance Programs **Ohio:** Ohio Department of Medicaid
Measurement Periods	Month, calendar year (2019 only), HCS evaluation period (July 1, 2021–June 30, 2022), and comparison years before and after the evaluation period (July 1–June 30)
Population	Medicaid enrollees who were aged 18-64 years at some point during the measurement period and were not dual eligible (for Medicaid and Medicare) during the first month of the measurement period. The population is divided into four mutually exclusive subgroups: 1. Number of individuals with OUD in measurement period OR in 12 months prior; 2. Number of individuals who received MOUD in measurement period OR in 12 months prior **(excluding subgroup 1)**; 3. Number of individuals who received opioid pain medication prescription fill in measurement period OR in 12 months prior **(excluding subgroups 1 and 2)**; 4. All other individuals **(excluding subgroups 1, 2, and 3)** Note: See ***Appendix G*** for more detail.
Operational Definition	1. Across all individuals in the population, count the number of outpatient visits with a behavioral health diagnosis code. BH diagnosis codes are F01–F69; F90–F99. Contains Primary BH diagnosis: F01–F69; F90–F99 (primary diagnosis code) And

	Place of service: 02, 03, 04, 05, 06, 07, 08, 11, 12, 14, 15, 16, 17, 18, 19, 20, 22, 24, 49, 50, 53, 57, 58, 62, 71, 72 And not Procedure code: 99281, 99282, 99283, 99284, 99285, 99288, H2034, H2036, H0010, H0011, H0015, H0017, H0018, H0019, H0035, S9480, S0201 And not revenue code: 100–219; 450, 451, 452, 456, 459, 981, 905, 906, 907, 912, 913, 1001, 1002 And not claim type = "I". **Community Attribution:** Identify HCS communities by location of residence. Use the most recent residence record from the measurement period to determine the HCS community.
Stratifications	For calendar year 2019, evaluation period (July 1, 2021–June 30, 2022), and comparison years (July 1–June 30). **Age:** 18–34, 35–54, 55–64 years, as of first day of measurement period **Sex:** Male, female **Race/Ethnicity:** Hispanic; non-Hispanic White; non-Hispanic Black; non-Hispanic Other; missing
Limitations	This measure is limited to people enrolled in Medicaid. **Age:** 18–64 years **Note**: This measure does not require continuous enrollment during the measurement period.

M 4.5.2: Number of outpatient visits NOT related to mental/behavioral disorders (Medicaid)

Measure Description	Number of outpatient visits that were non-behavioral health (non-BH) related among individuals enrolled in Medicaid aged 18-64.
Background	This measure helps to establish Medicaid service utilization and costs associated with the Communities That HEAL (CTH) intervention. Outpatient visits may be impacted by the CTH intervention. Non-BH outpatient visits have different costs on average compared to BH related outpatient visits.
Data Sources	Administrative Medicaid claims data **Kentucky:** Kentucky Cabinet for Health and Family Services, Department for Medicaid Services **Massachusetts:** Massachusetts Executive Office of Health and Human Services

	New York: New York State Department of Health, Office of Health Insurance Programs **Ohio:** Ohio Department of Medicaid
Measurement Periods	Month, calendar year (2019 only), HCS evaluation period (July 1, 2021–June 30, 2022), and comparison years before and after the evaluation period (July 1–June 30)
Population	Medicaid enrollees who were aged 18-64 years at some point during the measurement period and were not dual eligible (for Medicaid and Medicare) during the first month of the measurement period. The population is divided into four mutually exclusive subgroups: 1. Number of individuals with OUD in measurement period OR in 12 months prior; 2. Number of individuals who received MOUD in measurement period OR in 12 months prior **(excluding subgroup 1)**; 3. Number of individuals who received opioid pain medication prescription fill in measurement period OR in 12 months prior **(excluding subgroups 1 and 2)**; 4. All other individuals **(excluding subgroups 1, 2, and 3)** Note: See ***Appendix G*** for more detail.
Operational Definition	1. Across all individuals in the population, count the number of outpatient visits that do NOT have a behavioral health diagnosis code. BH diagnosis codes are F01 – F69; F90 – F99. Contains Place of service: 02, 03, 04, 05, 06, 07, 08, 11, 12, 14, 15, 16, 17, 18, 19, 20, 22, 24, 49, 50, 53, 57, 58, 62, 71, 72 And not Primary BH diagnosis: F01–F69; F90–F99 (primary diagnosis code) And not Procedure code: 99281, 99282, 99283, 99284, 99285, 99288, H2034, H2036, H0010, H0011, H0015, H0017, H0018, H0019, H0035, S9480, S0201 And not revenue code: 100–219; 450, 451, 452, 456, 459, 981, 905, 906, 907, 912, 913, 1001, 1002 And not Use claim type = “I” **Community Attribution:** Identify HCS communities by location of residence. Use the most recent residence record from the measurement period to determine the HCS community.

Stratifications	For calendar year 2019, evaluation period (July 1, 2021–June 30, 2022), and comparison years (July 1–June 30). **Age:** 18–34, 35–54, 55–64 years, as of first day of measurement period **Sex:** Male, female **Race/Ethnicity:** Hispanic; non-Hispanic White; non-Hispanic Black; non-Hispanic Other; missing
Limitations	N/A

M 4.6.1: Number of medication days' supply of sublingual buprenorphine for OUD (Medicaid)

Measure Description	Number of sublingual buprenorphine days' supply for treatment of OUD among individuals enrolled in Medicaid aged 18–64.
Background	This measure uses both prescription drug claims and outpatient claims. The reason for two datasets is sublingual buprenorphine is given in two ways. In the first way, the provider writes a prescription and the patient purchases the filled prescription from a pharmacy. In the second way, sublingual buprenorphine is office administered, which may include a take-home dose. This measure helps to establish Medicaid service utilization and costs associated with the Communities That HEAL (CTH) intervention. Use of MOUD may be impacted by the CTH intervention. The medications that make up MOUD have different unit costs.
Data Sources	Administrative Medicaid claims data **Kentucky:** Kentucky Cabinet for Health and Family Services, Department for Medicaid Services **Massachusetts:** Massachusetts Executive Office of Health and Human Services **New York:** New York State Department of Health, Office of Health Insurance Programs **Ohio:** Ohio Department of Medicaid
Measurement Periods	Month, calendar year (2019 only), HCS evaluation period (July 1, 2021–June 30, 2022), and comparison years before and after the evaluation period (July 1–June 30)
Population	Medicaid enrollees who were aged 18-64 years at some point during the measurement period and were not dual eligible (for Medicaid and Medicare) during the first month of the measurement period. The population is divided into two mutually exclusive subgroups: 1. Number of individuals with OUD in measurement period OR in 12 months prior;

	2. Number of individuals who received MOUD in measurement period OR in 12 months prior **(excluding subgroup 1)**; Note: See ***Appendix G*** for more detail.
Operational Definition	1. Across all individuals in the population, count the number of days supplied that are sublingual buprenorphine for OUD. Count the days supplied from prescription fills. For National Drug Codes (NDCs), please see ***Appendix C*** for a description of how NDCs were included in the measure. NDCs were updated quarterly by the HCS team using the Medi-Span Electronic Drug File (MED-File) v2 for active and inactive products (Wolter Kluwer, 2020). Next, count the days supplied of office-administered sublingual buprenorphine using procedure codes. Then sum the total days supplied across the two data sources. 2. Procedure codes may vary by state; use procedure codes and qualifying criteria that reflect state policy. For outpatient procedure codes, do not include claims where claim type = "I". 3. All days supplied for a prescription fill or office administration should be attributed to the month and year of the prescription fill date or claim date, respectively. This rule applies even when the days supplied extend over multiple months or years. Days supplied should be counted as the number of days covered. For example, if a prescription is for 30 units but 2 per day, days supplied is 15. **Community Attribution:** Identify HCS communities by location of residence. Use the most recent residence record from the measurement period to determine the HCS community.
Stratifications	For calendar year 2019, evaluation period (July 1, 2021–June 30, 2022), and comparison years (July 1–June 30). **Age:** 18–34, 35–54, 55–64 years, as of first day of measurement period **Sex:** Male, female **Race/Ethnicity:** Hispanic; non-Hispanic White; non-Hispanic Black; non-Hispanic Other; missing
Limitations	Days' supply is an inexact measure of days covered. For example, an individual may have two different prescriptions to get the appropriate dosage. The measure would count days' supply across both prescriptions, in effect overcounting days' supply.
Resources	Wolters Kluwer. (2020). Medi-Span Electronic Drug File (MED-File) v2.

M 4.6.2: Number of injections of buprenorphine for OUD (Medicaid)

Measure Description	Number of buprenorphine injections for treatment of OUD among individuals enrolled in Medicaid aged 18-64.
Background	This measure uses outpatient claims and prescription drug claims. The measure counts the number of injections in each dataset and sums them to get a total count of buprenorphine injections for OUD. The reason for using

	two datasets is injections are given in two ways. In the first way, the provider already has the buprenorphine injection and submits a claim with a special injection code to get reimbursed for the cost of the drug. In the second way, the patient receives a prescription for the injection. Once obtaining the prescription, the patient takes the drug to a physician who injects the drug. In this case, the physician bills a generic injection code. The main cost of the injection in the second option is the prescription fill. Thus, we are only interested in the prescription fill in this case. This measure helps to establish Medicaid service utilization and costs associated with the Communities That HEAL (CTH) intervention. Use of MOUD may be impacted by the CTH intervention. The medications that make up MOUD have different unit costs.
Data Sources	Administrative Medicaid claims data **Kentucky:** Kentucky Cabinet for Health and Family Services, Department for Medicaid Services **Massachusetts:** Massachusetts Executive Office of Health and Human Services **New York:** New York State Department of Health, Office of Health Insurance Programs **Ohio:** Ohio Department of Medicaid
Measurement Periods	Month, calendar year (2019 only), HCS evaluation period (July 1, 2021–June 30, 2022), and comparison years before and after the evaluation period (July 1–June 30)
Population	Medicaid enrollees who were aged 18-64 years at some point during the measurement period and were not dual eligible (for Medicaid and Medicare) during the first month of the measurement period. The population is divided into two mutually exclusive subgroups: 1. Number of individuals with OUD in measurement period OR in 12 months prior; 2. Number of individuals who received MOUD in measurement period OR in 12 months prior **(excluding subgroup 1)**; Note: See ***Appendix G*** for more detail.
Operational Definition	1. Across all individuals in the population, count the number of claims that are for buprenorphine injections for OUD, plus the number of prescription fills that are buprenorphine injections for OUD. 2. Procedure codes may vary by state; use procedure codes and qualifying criteria that reflect state policy. For outpatient procedure codes, do not include claims where claim type = "I". For National Drug Codes (NDCs), please see ***Appendix C*** for a description of how NDCs were included in the measure. NDCs were updated quarterly by the HCS team using the Medi-Span Electronic Drug File (MED-File) v2 for active and inactive products (Wolter Kluwer, 2020).

	Community Attribution: Identify HCS communities by location of residence. Use the most recent residence record from the measurement period to determine the HCS community.
Stratifications	For calendar year 2019, evaluation period (July 1, 2021–June 30, 2022), and comparison years (July 1–June 30). **Age:** 18–34, 35–54, 55–64 years, as of first day of measurement period **Sex:** Male, female **Race/Ethnicity:** Hispanic; non-Hispanic White; non-Hispanic Black; non-Hispanic Other; missing
Limitations	N/A
Resources	Wolters Kluwer. (2020). Medi-Span Electronic Drug File (MED-File) v2.

M 4.6.3: Number of medication days' supply of oral naltrexone for OUD (Medicaid)

Measure Description	Number of prescription days' supply for naltrexone for treatment of OUD among individuals enrolled in Medicaid aged 18-64.
Background	The population for this measure requires evidence (i.e., a diagnosis) of an OUD in the measurement period or in the past 12 months. This measure helps to establish Medicaid service utilization and costs associated with the Communities That HEAL (CTH) intervention. Use of MOUD may be impacted by the CTH intervention. The medications that make up MOUD have different unit costs.
Data Sources	Administrative Medicaid claims data **Kentucky:** Kentucky Cabinet for Health and Family Services, Department for Medicaid Services **Massachusetts:** Massachusetts Executive Office of Health and Human Services **New York:** New York State Department of Health, Office of Health Insurance Programs **Ohio:** Ohio Department of Medicaid
Measurement Periods	Month, calendar year (2019 only), HCS evaluation period (July 1, 2021–June 30, 2022), and comparison years before and after the evaluation period (July 1–June 30)
Population	Medicaid enrollees who were aged 18-64 years at some point during the measurement period who were not dual eligible (for Medicaid and Medicare) during the first month of the measurement period, and had an ICD-10-CM Diagnosis Code of F11.1X or F11.2X ("opioid abuse" or "opioid dependence") in the measurement period OR in the 12 months prior.
Operational Definition	1. Across all individuals in the population, count the number of prescription days supplied that are opioid related oral naltrexone fills. For National

	Drug Codes (NDCs), please see ***Appendix C*** for a description of how NDCs were included in the measure. NDCs were updated quarterly by the HCS team using the Medi-Span Electronic Drug File (MED-File) v2 for active and inactive products (Wolter Kluwer, 2020). 2. All days supplied for a prescription fill should be attributed to the month and year of the prescription fill date. This rule applies even when the days supplied extend over multiple months or years. Days supplied should be counted as the number of days covered. For example, if a prescription is for 30 units but 2 per day, days supplied is 15. **Community Attribution:** Identify HCS communities by location of residence. Use the most recent residence record from the measurement period to determine the HCS community.
Stratifications	For calendar year 2019, evaluation period (July 1, 2021–June 30, 2022), and comparison years (July 1–June 30). **Age:** 18–34, 35–54, 55–64 years, as of first day of measurement period **Sex:** Male, female **Race/Ethnicity:** Hispanic; non-Hispanic White; non-Hispanic Black; non-Hispanic Other; missing
Limitations	Days' supply is an inexact measure of days covered. For example, an individual may have two different prescriptions to get the appropriate dosage. The measure would count days' supply across both prescriptions, in effect overcounting days' supply.
Resources	Wolters Kluwer. (2020). Medi-Span Electronic Drug File (MED-File) v2.

M 4.6.4: Number of injections of naltrexone for OUD (Medicaid)

Measure Description	Number of naltrexone injections for treatment of OUD among individuals enrolled in Medicaid aged 18–64.
Background	This measure uses both outpatient claims and prescription drug claims. The measure counts the number of injections in each dataset and sums them to get a total count of opioid related naltrexone injections. The reason for using two datasets is injections are given in two ways. In the first way, the provider already has the naltrexone injection and submits a claim with a special injection code to get reimbursed for the cost of the drug. In the second way, the patient receives a prescription for the injection. Once obtaining the prescription, the patient takes the drug to a physician who injects the drug. In this case, the physician bills a generic injection code. The main cost of the injection in the second option is the prescription fill. Thus, we are only interested in the prescription fill in this case. The population in the denominator for this measure requires evidence (i.e., a diagnosis) of an OUD in the measurement period or in the past 12 months. This measure helps to establish Medicaid service utilization and costs associated with the Communities That HEAL (CTH) intervention. Use of MOUD may be

	impacted by the CTH intervention. The medications that make up MOUD have different unit costs.
Data Sources	Administrative Medicaid claims data **Kentucky:** Kentucky Cabinet for Health and Family Services, Department for Medicaid Services **Massachusetts:** Massachusetts Executive Office of Health and Human Services **New York:** New York State Department of Health, Office of Health Insurance Programs **Ohio:** Ohio Department of Medicaid
Measurement Periods	Month, calendar year (2019 only), HCS evaluation period (July 1, 2021–June 30, 2022), and comparison years before and after the evaluation period (July 1–June 30)
Population	Medicaid enrollees who were aged 18-64 years at some point during the measurement period who were not dual eligible (for Medicaid and Medicare) during the first month of the measurement period, and had an ICD-10-CM Diagnosis Code of F11.1X or F11.2X (“opioid abuse” or “opioid dependence”) in the measurement period OR in the 12 months prior.
Operational Definition	1. Across all individuals in the population, count the number of claims that are a Naltrexone injection, plus the number of prescription fills that are a Naltrexone injection. 2. Procedure codes may vary by state; use procedure codes and qualifying criteria that reflect state policy. For outpatient procedure codes, do not include claims where claim type = “I”. For National Drug Codes (NDCs), please see ***Appendix C*** for a description of how NDCs were included in the measure. NDCs were updated quarterly by the HCS team using the Medi-Span Electronic Drug File (MED-File) v2 for active and inactive products (Wolter Kluwer, 2020). **Community Attribution:** Identify HCS communities by location of residence. Use the most recent residence record from the measurement period to determine the HCS community.
Stratifications	For calendar year 2019, evaluation period (July 1, 2021–June 30, 2022), and comparison years (July 1–June 30). **Age:** 18–34, 35–54, 55–64 years, as of first day of measurement period **Sex:** Male, female **Race/Ethnicity:** Hispanic; non-Hispanic White; non-Hispanic Black; non-Hispanic Other; missing
Limitations	N/A
Resources	Wolters Kluwer. (2020). Medi-Span Electronic Drug File (MED-File) v2.

M 4.6.5: Number of medication days' supply of methadone for OUD (Medicaid)

Measure Description	Number of methadone days' supply for treatment of OUD among individuals enrolled in Medicaid aged 18-64.
Background	This measure helps to establish Medicaid service utilization and costs associated with the Communities That HEAL (CTH) intervention. Use of MOUD may be impacted by the CTH intervention. The medications that make up MOUD have different unit costs.
Data Sources	Administrative Medicaid claims data **Kentucky:** Kentucky Cabinet for Health and Family Services, Department for Medicaid Services **Massachusetts:** Massachusetts Executive Office of Health and Human Services **New York:** New York State Department of Health, Office of Health Insurance Programs **Ohio:** Ohio Department of Medicaid
Measurement Periods	Month, calendar year (2019 only), HCS evaluation period (July 1, 2021–June 30, 2022), and comparison years before and after the evaluation period (July 1–June 30)
Population	Medicaid enrollees who were aged 18-64 years at some point during the measurement period and were not dual eligible (for Medicaid and Medicare) during the first month of the measurement period. The population is divided into two mutually exclusive subgroups: 1. Number of individuals with OUD in measurement period OR in 12 months prior; 2. Number of individuals who received MOUD in measurement period OR in 12 months prior **(excluding subgroup 1)**; Note: See ***Appendix G*** for more detail.
Operational Definition	1. Across all individuals in the population, count the number of days methadone was supplied. Each state has its own algorithm for calculating days' supply. 2. Attribution of methadone administration to relevant month and year All days supplied for methadone administration should be attributed to the month and year of the methadone administration date. This rule applies even when the days supplied extend over multiple months or years. Days supplied should be counted as the number of days covered. For example, if 30 units are given but instructions are to take 2 per day, days supplied is 15.

	Community Attribution: Identify HCS communities by location of residence. Use the most recent residence record from the measurement period to determine the HCS community.
State-specific Specifications	Use procedure codes to identify office-based methadone (states should use MOUD procedure codes and criteria that best reflect state methadone policy and coding). Because these are office-based claims, do not include claims where claim type = "I" Procedure codes for MOUD vary by state. Most states use procedure code H0020 for methadone administration. Each state will need to implement its own algorithm based on the details below to accurately sum up the number of days methadone was supplied, across all individuals in the denominator. **Kentucky:** Uses H0020 as a weekly bundle code. There is no difference in billing practices for take-home amounts. Thus, an instance of an H0020 code is equivalent to 7 days supplied. **Massachusetts:** Uses H0020 as a daily claim. There is no difference in billing practices for take-home amounts. Thus, an instance of an H0020 code is equivalent to 1 day supplied. **New York:** Uses H0020 for methadone administration. **Prior to March 16, 2020**, providers had the option of billing daily or weekly. For daily visits, the first visit of the week required a 'KP' modifier to get a higher reimbursement; the rest of the week did not have a modifier. NY stated that it can determine whether the code is being used as a daily claim or as a weekly claim and count days supplied accordingly. **Starting on March 16, 2020**, new take-home dispensing codes were introduced. G2067 and G2078 are both used to specify a weekly (i.e., 7 days) dispensed amount. H0020 can still be billed in this new period. **Ohio:** Uses H0020 for methadone administration. Without a modifier, H0020 is for a single in person administration (i.e., 1 day supplied). For take-home doses supplied, Ohio uses the following modifiers: 'HF'=1 day; 'TV'=1 week; 'UB'=2 weeks; 'TS'=3 weeks; 'HG'=4 weeks.
Stratifications	For calendar year 2019, evaluation period (July 1, 2021–June 30, 2022), and comparison years (July 1–June 30). **Age:** 18–34, 35–54, 55–64 years, as of first day of measurement period **Sex:** Male, female **Race/Ethnicity:** Hispanic; non-Hispanic White; non-Hispanic Black; non-Hispanic Other; missing
Limitations	N/A

M 4.7.1: Number of medication days' supply of opioid pain prescriptions (Medicaid)	
Measure Description	Number of opioid pain prescription days' supply among individuals enrolled in Medicaid aged 18–64.
Background	This measure helps to establish Medicaid service utilization and costs associated with the Communities That HEAL (CTH) intervention. The prescription of opioids for pain may be impacted by the CTH intervention.
Data Sources	Administrative Medicaid claims data **Kentucky:** Kentucky Cabinet for Health and Family Services, Department for Medicaid Services **Massachusetts:** Massachusetts Executive Office of Health and Human Services **New York:** New York State Department of Health, Office of Health Insurance Programs **Ohio:** Ohio Department of Medicaid
Measurement Periods	Month, calendar year (2019 only), HCS evaluation period (July 1, 2021–June 30, 2022), and comparison years before and after the evaluation period (July 1–June 30)
Population	Medicaid enrollees who were aged 18-64 years at some point during the measurement period and were not dual eligible (for Medicaid and Medicare) during the first month of the measurement period. The population is divided into three mutually exclusive subgroups: 1. Number of individuals with OUD in measurement period OR in 12 months prior; 2. Number of individuals who received MOUD in measurement period OR in 12 months prior **(excluding subgroup 1)**; 3. Number of individuals who received opioid pain medication prescription fill in measurement period OR in 12 months prior **(excluding subgroups 1 and 2)**; Note: See ***Appendix G*** for more detail.
Operational Definition	1. Across all individuals in the population, count the number of prescription days supplied that are opioid pain medication fills. For National Drug Codes (NDCs), please see ***Appendix C*** for a description of how NDCs were included in the measure. NDCs were updated quarterly by the HCS team using the Medi-Span Electronic Drug File (MED-File) v2 for active and inactive products (Wolter Kluwer, 2020). 2. Attribution of prescription fill to relevant month and year All days supplied for a prescription fill should be attributed to the month and year of the prescription fill date. This rule applies even when the days supplied extend over multiple months or years.

	Days supplied should be counted as the number of days covered. For example, if a prescription is for 30 units but 2 per day, days supplied is 15. **Community Attribution:** Identify HCS communities by location of residence. Use the most recent residence record from the measurement period to determine the HCS community.
Stratifications	For calendar year 2019, evaluation period (July 1, 2021–June 30, 2022), and comparison years (July 1–June 30). **Age:** 18–34, 35–54, 55–64 years, as of first day of measurement period **Sex:** Male, female **Race/Ethnicity:** Hispanic; non-Hispanic White; non-Hispanic Black; non-Hispanic Other; missing
Limitations	Days' supply is an inexact measure of days covered. For example, an individual may have two different prescriptions to get the appropriate dosage. The measure would count days' supply across both prescriptions, in effect overcounting days' supply.
Resources	Wolters Kluwer. (2020). Medi-Span Electronic Drug File (MED-File) v2.

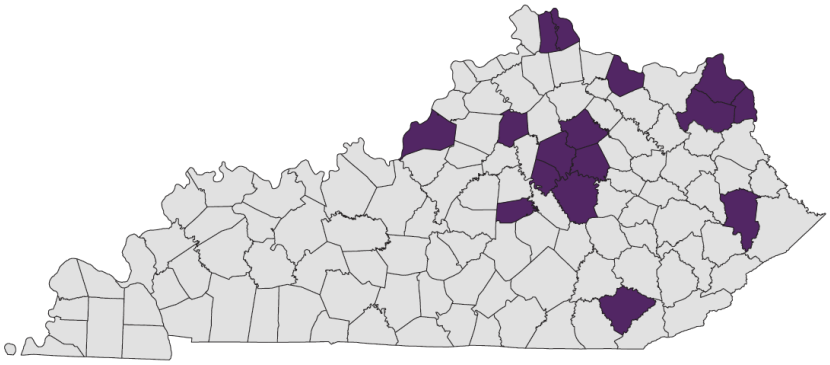
M 4.7.2: Number of medication days' supply of non-opioid pain prescriptions (Medicaid)

Measure Description	Number of non-opioid pain prescription days' supply among individuals enrolled in Medicaid aged 18-64.
Background	This measure helps to establish Medicaid service utilization and costs associated with the Communities That HEAL (CTH) intervention. The prescription of non-opioids for pain may be impacted by the CTH intervention.
Data Sources	Administrative Medicaid claims data **Kentucky:** Kentucky Cabinet for Health and Family Services, Department for Medicaid Services **Massachusetts:** Massachusetts Executive Office of Health and Human Services **New York:** New York State Department of Health, Office of Health Insurance Programs **Ohio:** Ohio Department of Medicaid
Measurement Periods	Month, calendar year (2019 only), HCS evaluation period (July 1, 2021–June 30, 2022), and comparison years before and after the evaluation period (July 1–June 30)
Population	Medicaid enrollees who were aged 18-64 years at some point during the measurement period and were not dual eligible (for Medicaid and Medicare) during the first month of the measurement period.

	The population is divided into four mutually exclusive subgroups: 1. Number of individuals with OUD in measurement period OR in 12 months prior; 2. Number of individuals who received MOUD in measurement period OR in 12 months prior **(excluding subgroup 1)**; 3. Number of individuals who received opioid pain medication prescription fill in measurement period OR in 12 months prior **(excluding subgroups 1 and 2)**; 4. All other individuals **(excluding subgroups 1, 2, and 3)** Note: See ***Appendix G*** for more detail.
Operational Definition	1. Across all individuals in the population, count the number of prescription days supplied that are non-opioid pain medication fills. For National Drug Codes (NDCs), please see ***Appendix C*** for a description of how NDCs were included in the measure. NDCs were updated quarterly by the HCS team using the Medi-Span Electronic Drug File (MED-File) v2 for active and inactive products (Wolter Kluwer, 2020). 2. Attribution of prescription fill to relevant month and year All days supplied for a prescription fill should be attributed to the month and year of the prescription fill date. This rule applies even when the days supplied extend over multiple months or years. Days supplied should be counted as the number of days covered. For example, if a prescription is for 30 units but 2 per day, days supplied is 15. **Community Attribution:** Identify HCS communities by location of residence. Use the most recent residence record from the measurement period to determine the HCS community.
Stratifications	For calendar year 2019, evaluation period (July 1, 2021–June 30, 2022), and comparison years (July 1–June 30). **Age:** 18–34, 35–54, 55–64 years, as of first day of measurement period **Sex:** Male, female **Race/Ethnicity:** Hispanic; non-Hispanic White; non-Hispanic Black; non-Hispanic Other; missing
Limitations	Days' supply is an inexact measure of days covered. For example, an individual may have two different prescriptions to get the appropriate dosage. The measure would count days' supply across both prescriptions, in effect overcounting days' supply.
Resources	Wolters Kluwer. (2020). Medi-Span Electronic Drug File (MED-File) v2.

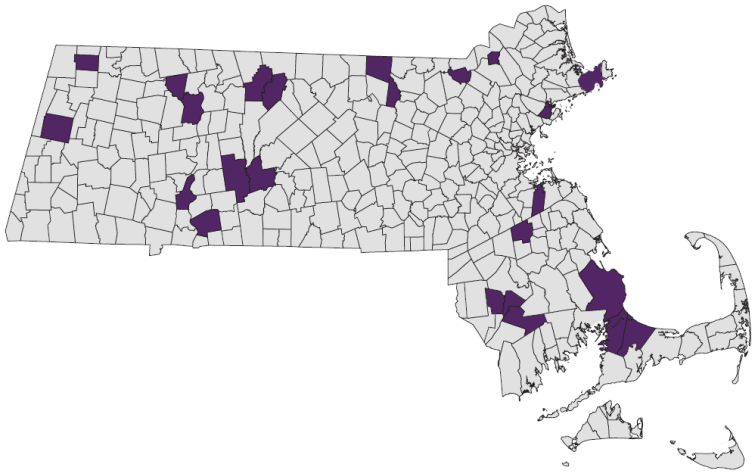
Appendices

Appendix A. Site Maps and Community Locations



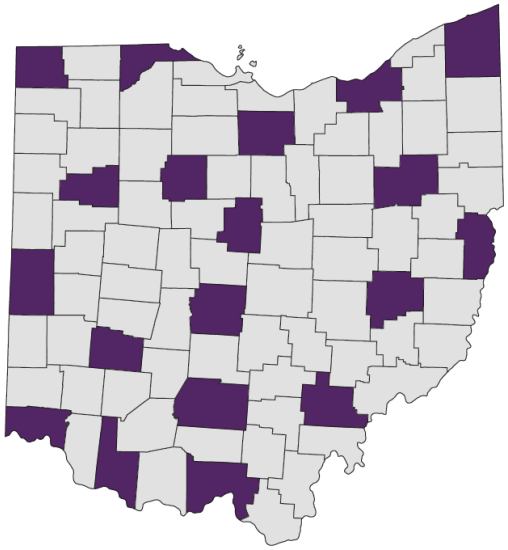
Kentucky

- Bourbon
- Boyd
- Boyle
- Campbell
- Carter
- Clark
- Fayette
- Floyd
- Franklin
- Greenup
- Jefferson
- Jessamine
- Kenton
- Knox
- Madison
- Mason



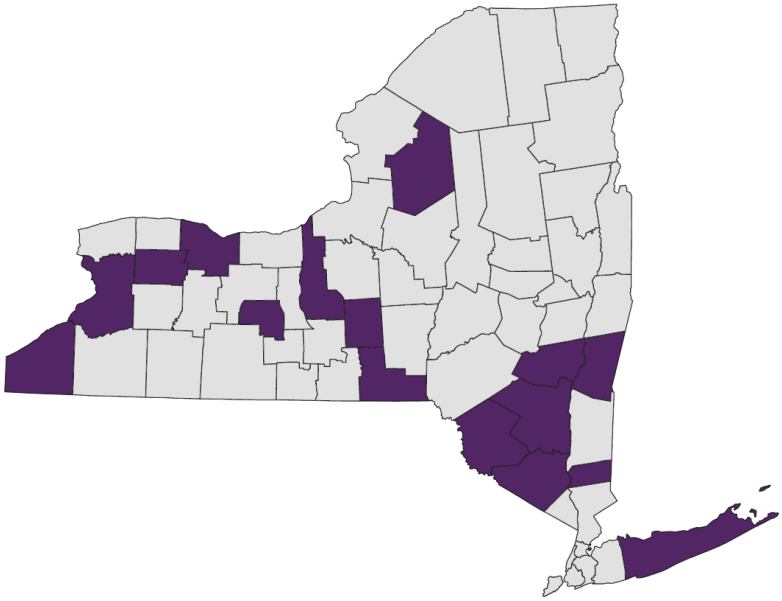
Massachusetts

- Athol
- Belchertown
- Berkley
- Brockton
- Bourne
- Dighton
- Freetown
- Gloucester
- Greenfield
- Holyoke
- Lawrence
- Lowell
- Montague
- North Adams
- Orange
- Plymouth
- Pittsfield
- Salem
- Sandwich
- Shirley
- Springfield
- Townsend
- Ware
- Weymouth



Ohio

- Allen
- Ashtabula
- Athens
- Brown
- Cuyahoga
- Darke
- Franklin
- Greene
- Guernsey
- Hamilton
- Huron
- Jefferson
- Lucas
- Morrow
- Ross
- Scioto
- Stark
- Williams
- Wyandot



New York

- Broome
- Cayuga
- Chautauqua
- Clark
- Cortland
- Erie
- Fayette
- Floyd
- Franklin
- Genesee
- Greene
- Jefferson
- Jessamine
- Kenton
- Lewis
- Madison
- Monroe
- Orange
- Putnam
- Sullivan
- Ulster
- Yates

Appendix B. Analytic Data Set Specifications for Prescription Drug Monitoring Program (PDMP) Measures

The following steps detail creation of analytic data sets to facilitate PDMP ascertainment:

Select records.

A. Create macro variables that contain the start date and end date of the data being analyzed. If the beginning of the measurement period is January 1, 2017, the start date of the data analyzed should be July 1, 2016, because 6 months of records are needed for lookback. The end date should not exceed the date of the most recent available PDMP data.

B. Create a table of HCS communities. Include any information you will need to join this table with the PDMP data (e.g., zip codes, city/town names, county names).

C. From the PDMP database, select the IDs of all patients who filled a prescription while a resident of an HCS community between the dates defined in step A.

D. Select all PDMP records of the patients selected in step C, regardless of the residence stated on the individual records.

Clean dates of birth and restrict age.

E. Select unique combinations of patient ID and date of birth from the table created in step D where date of birth is not null. For each patient ID, keep one record with the most frequent date of birth for that patient. If two or more dates of birth occur with the same frequency, keep the latest date. Using this date of birth throughout will enable us to use records with missing dates of birth and to avoid deleting records with date of birth typos or a missing date of birth.

F. Join the tables created in steps D and E. Calculate the age of the patient on the date of each prescription fill. Delete records where the patient is younger than 17 years of age. Also delete records where the patient is younger than 18 years of age on the end date defined in step A. Calculate the month and year in which each patient turned 18 years of age. Results below will be calculated for patients who were 18 years of age or older in the month that is being evaluated. The records from the year in which patients are 17 years of age will be used for lookback.

Create residence tables.

G. From records with non-missing residences in the table created in step F, for each patient in each month that the patient filled a prescription, select the patient ID, month of the fill, quarter of the fill, year of the fill, and the patient's residence associated with their final fill (latest fill date) in each month. Select residences regardless of whether they are HCS communities.

   If a patient has two or more fills on the patient's last fill date of the month and those fills are associated with two or more residences, select the first record when sorting by the following variables:

   1. Descending binary variable that indicates if the residence is an HCS community (giving preference to HCS communities over non-HCS communities)
   2. Descending days supplied (giving preference to records with greater days supplied)
   3. Ascending last four digits of National Drug Code (NDC) number
   4. Ascending prescriber U.S. Drug Enforcement Administration number

This residence is each patient's final residence for each month, regardless of whether it is an HCS community. For months in the date range defined in step A in which a patient does not have a prescription fill, carry forward the last prior non-missing monthly residence.

H. From the table generated in step G, select the patient ID and residence for the latest available month in each quarter (e.g., if a patient filled prescriptions in January 2018 and February 2018 but not in March 2018, the February 2018 residence will be the Q1 2018 residence). These residences reflect each patient's final residence for each quarter, regardless of whether it is an HCS community.

I. From the table generated in step G, select the patient ID, residence combination for the latest available month of each year , where year is defined as either a 12-month calendar year (January–December) or a 12-month comparison year (July–June). This residence reflects each patient's final residence for each year, regardless of whether it is an HCS community.

J. From the table created in step G, delete the rows in which the patient's residence is not an HCS community. The remaining monthly residences will be used when the patient is included in monthly counts.

K. From the table created in step H, delete the rows in which the patient's residence is not an HCS community. The remaining quarterly residences will be used when the patient is included in quarterly counts.

L. From the table created in step I, delete the rows in which the patient's residence is not an HCS community. The remaining yearly residences will be used when the patient is included in yearly counts.

Select records of interest.

M. From the table created in step F, use the HCS-approved dataset to select all filled prescriptions for buprenorphine or buprenorphine/naloxone products approved by the U.S. FDA for the treatment of OUD. Exclude transdermal buprenorphine and Belbuca, which are indicated for pain.

N. From the table created in step F, use the HCS-approved dataset with appended morphine milligram equivalent data to select all filled prescriptions for opioids. Exclude the following buprenorphine formulations: extended release, subcutaneous, implant, and tablet. Exclude buprenorphine/naloxone film. Exclude solution formulations of codeine.

O. From the table created in step F, use the HCS-approved dataset to select all filled prescriptions for benzodiazepines.

Appendix C. National Drug Code Selection Description

To maintain consistency across sites, the team developed a standardized list of National Drug Codes (NDCs) for opioids, benzodiazepines, and MOUD using the Medi-Span Electronic Drug File (MED-File) v2 and the Drug Inactive Data File (Wolters Kluwer, 2020). The standardized study drug list is updated quarterly. The MED-File includes product names, dosage forms, strength, the NDC, and generic product identifier (GPI). The GPI is a 14-digit number that allows identification of drug products by primary and secondary classifications and simplifies identification of similar drug products from different manufacturers or different packaging. Because our study requires baseline data on opioid utilization, the inactive date file is used to include drugs that may be currently inactive but were used during the baseline period.

All GPIs beginning with the classification “65”—which identifies any drug product containing an opioid or combination—are included in the opioid list. Next, opioid products that are not likely to be used in the outpatient/ambulatory pharmacy setting—such as bulk powder, bulk chemicals, and dosage forms typically used in hospitals or hospice settings (e.g., epidurals, IVs)—are excluded. Products classified as cough/cold/allergy combinations, cough medications, antidiarrheal/probiotic agents, buprenorphine products used for OUD and pain, and methadone products used for OUD were also excluded. The U.S. Centers for Disease Control and Prevention (CDC) file that identifies oral morphine milligram equivalents (MMEs)[a] (CDC, 2019) was used to add MMEs to each opioid product and to identify products as long-acting or short-acting. To ensure the HCS list includes all current and inactive products, the U.S. CDC list was cross-referenced with the list of all GPI products.

The benzodiazepine products are identified using the GPI classification “57,” which identifies any drug product containing a benzodiazepine or combination. Products that are not likely to be used in the outpatient/ambulatory pharmacy setting—such as bulk powder, bulk chemicals, and dosage forms typically used in hospitals or hospice settings—were excluded.

Buprenorphine MOUD records included those with Medi-Span GPI codes starting with '6520001'; codes excluded were records labeled with 'undeterminable' efficacy, 'injectable' (other than Sublocade, which is included), or 'transdermal' routes of administration, or GPI/drug names containing 'Buprenorphine HCL Buccal Film' or 'Probuphine'.

[a] CDC File of National Drug Codes for Opioid analgesics, and Linked Oral Morphine Milligram Equivalent Conversion Factors, 2020 Version. Atlanta, GA: Centers for Disease Control and Prevention; 2021. Opioid National Drug Code and Oral MME Conversion File Update | Opioids | CDC.

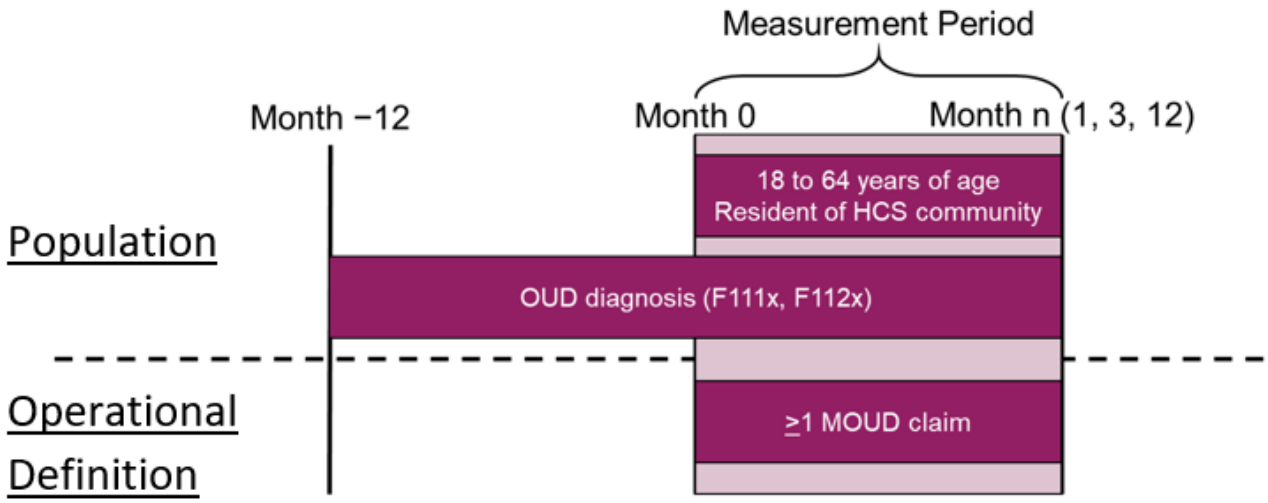
Appendix D. MOUD Type Code Lookup Table

MOUD Type	HCPCS Codes	Code Descriptions	State-Specific Criteria: Ohio	State-Specific Criteria: Kentucky	State-Specific Criteria: New York	State-Specific Criteria: Massachusetts
Methadone	H0020	Alcohol and/or drug services; methadone administration and/or service (provision of the drug by a licensed program)	Modifiers indicate days' supply: 'HF' One-day supply 'TV' One-week supply 'UB' Two-week supply 'TS' Three-week supply 'HG' Four-week supply (Missing modifier is classified as one-day supply)	All instances of H0020 counted as a 7-day supply	KP modifier is used for first med service of the week Also Uses: G2067 for weekly dispensing and G2078 medication only during weeks with no visit	MA does not use modifiers
Naltrexone (non-injection)	J8499	Oral prescrip drug non chemo	Also uses: J8499 + Modifier 'HG' for one-day supply of naltrexone	KY has no HCPCS codes for Oral Naltrexone	NY has no HCPCS codes for Oral Naltrexone	MA has no HCPCS codes for Oral Naltrexone
Naltrexone (injection)	J2315	Naltrexone, depot form				
Buprenorphine (non-injection)	J0571 J0572 J0573 J0574 J0575	Buprenorphine oral 1mg Bupren/nal up to 3mg bupreno Bupren/nal 3.1 to 6mg bupren Bupren/nal 6.1 to 10mg bupre Bupren/nal over 10mg bupreno	Also uses: J8499 for one-day dose of buprenorphine if it appears without a modifier. J8499 requires a buprenorphine National Drug Code (NDC). S5000 and S5001 for one-day supply of buprenorphine. Must be billed by provider type '95' to be considered buprenorphine for OUD.		Only Uses: J0571 J0572 J0574 Also Uses: G2068 for weekly dispensing buprenorphine (oral) and G2079 medication only during weeks with no visit.	J0574 and J0575 no longer in use in MA

MOUD Type	HCPCS Codes	Code Descriptions	State-Specific Criteria: Ohio	State-Specific Criteria: Kentucky	State-Specific Criteria: New York	State-Specific Criteria: Massachusetts
Buprenorphine (non-injection) (continued)			T1502 for varying days' supply. Must be billed by a provider type '95' or with a buprenorphine NDC. Modifiers indicate days' supply: 'HF' One-day supply 'TV' One-week supply 'UB' Two-week supply 'TS' Three-week supply 'HG' Four-week supply			
Buprenorphine (injection)	Q9991 Q9992	Buprenorph xr 100 mg or less Buprenorphine xr over 100 mg		Also Uses: J0570 J0592		

Appendix E. Visual Representation of the Operational Definition, Population, and Lookback Period for Medicaid MOUD Measures

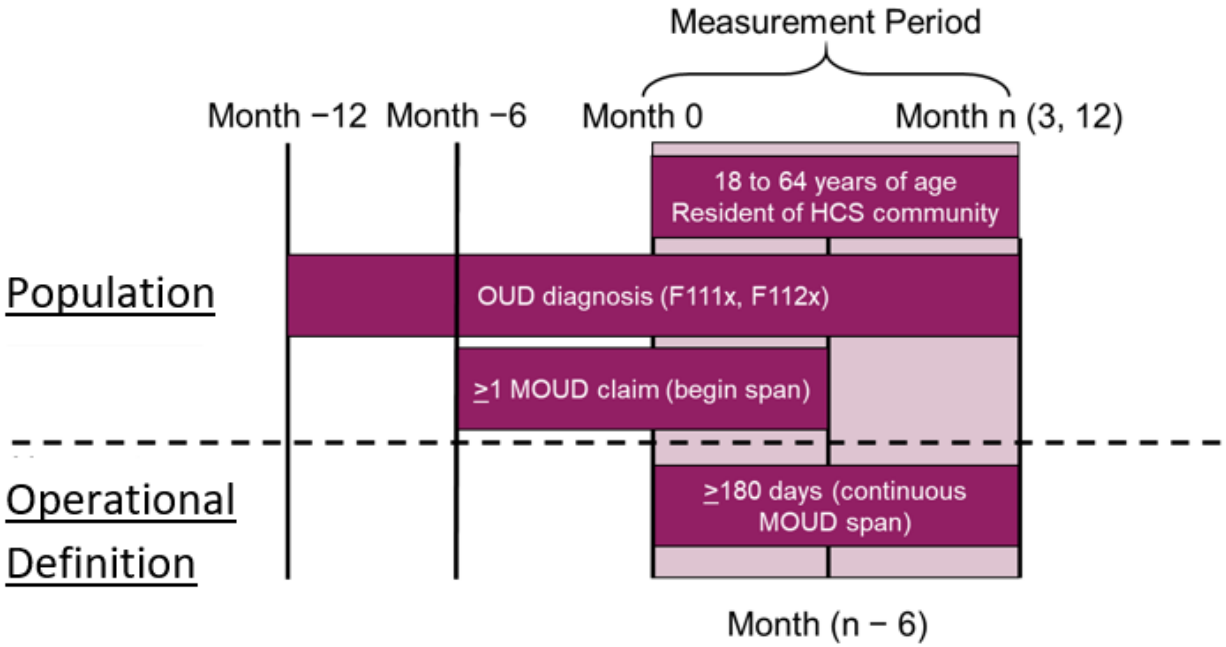
Figure E-1. Number of Individuals with OUD Who Received MOUD*



*Applies to the following Medicaid MOUD Submeasures: M 2.5.2 (methadone), M 2.5.3 (naltrexone: intramuscular [IM] injection or prescription oral [OP]), M 2.5.3.A (naltrexone: IM only), M 2.5.3.B (naltrexone: OP only), M 2.5.4 (any MOUD), M 2.5.5 (buprenorphine).

HCS = HEALing Communities Study; MOUD = medication for opioid use disorder; OUD = opioid use disorder.

Figure E-2. Number of Individuals with OUD Retained on MOUD for at Least 180 Days*



* Applies to the following Medicaid MOUD Submeasures: M 2.7.2 (methadone), M 2.7.3.A (naltrexone: intramuscular injection only), M 2.7.3.B (naltrexone: prescription oral only), M 2.7.4 (any MOUD), M 2.7.6 (buprenorphine).

HCS = HEALing Communities Study; MOUD = medication for opioid use disorder; OUD = opioid use disorder.

Figure E-3. Lookback Period for ≥1 MOUD Claim of Individuals with OUD Retained on MOUD for At Least 180 Days*

	Measurement Period, 2020		Lookback Period − 180 days	
Example	Start	End	Start	End
CY 2020	January 1	December 31	July 1, 2019	December 31, 2019
Q1 2020	January 1	March 31	July 1, 2019	December 31, 2019
Q2 2020	April 1	June 30	October 1, 2019	March 31, 2020
Q3 2020	July 1	September 30	January 1, 2020	June 30, 2020
Q4 2020	October 1	December 31	April 1, 2020	September 30, 2020

* Applies to the following Medicaid Submeasures: M 2.7.2 (methadone), M 2.7.3.A (naltrexone: intramuscular injection only), M 2.7.3.B (naltrexone: prescription oral only), M 2.7.4 (any MOUD), M 2.7.6 (buprenorphine).

CY = calendar year; HCS = HEALing Communities Study; MOUD = medication for opioid use disorder; OUD = opioid use disorder; Q = quarter.

Appendix F. Behavioral Health Code Lookup Table

Type	Code	Definition	M 2.6.1	M 2.6.2	M 2.6.3	M 2.6.4	M 2.6.5	M 2.6.6	M 2.6.7
Revenue Code	116	Private medical or general-detoxification	X			X			
Revenue Code	126	Semi-private 2 bed (medical or general)-detoxification	X			X			
Revenue Code	136	Semi-private 3 and 4 beds-detoxification	X			X			
Revenue Code	146	Private (deluxe)-detoxification	X			X			
Revenue Code	156	Room & Board ward (medical or general)-detoxification	X			X			
Revenue Code	1002	Residential treatment - chemical dependency	X			X			
Revenue Code	905	Behavioral Health Treatment/Services - intensive outpatient services-psychiatric (eff. 10/2004)		X		X			
Revenue Code	906	Behavioral Health Treatment/Services - intensive outpatient services-chemical dependency (eff. 10/2004)		X		X			
Revenue Code	912	Behavioral Health Treatment/Services-partial hospitalization-less intensive (eff. 10/2004); prior to 10/2004 defined as Psychiatric/psychological services-less intensive		X		X			
Revenue Code	913	Behavioral Health Treatment/Services-partial hospitalization-intensive (eff. 10/2004); prior to 10/2004 defined as Psychiatric/psychological services-intensive		X		X			
Revenue Code	944	Other therapeutic services-drug rehabilitation			X	X			
Revenue Code	945	Other therapeutic services-alcohol rehabilitation			X	X			
ICD-10-PCS	HZ2ZZZZ	Detoxification Services for Substance Abuse Treatment	X			X			
Place of Service	55	Residential Substance Abuse Treatment Facility	X			X			
HCPCS	H0009	Alcohol and/or drug services; acute detoxification (hospital inpatient)	X			X			

Type	Code	Definition	M 2.6.1	M 2.6.2	M 2.6.3	M 2.6.4	M 2.6.5	M 2.6.6	M 2.6.7
HCPCS	H0010	Alcohol and/or drug services; sub-acute detoxification (residential addiction program inpatient)	X			X			
HCPCS	H0011	Alcohol and/or drug services; acute detoxification (residential addiction program inpatient)	X			X			
HCPCS	H0012	Alcohol and/or drug services; sub-acute detoxification (residential addiction program outpatient)	X			X			
HCPCS	H2034	Alcohol and/or drug abuse halfway house services, per diem	X			X			
HCPCS	H2036	Alcohol and/or other drug treatment program, per diem	X			X			
HCPCS	H0019	Behavioral health; long-term residential (non-medical, non-acute care in a residential treatment program where stay is typically longer than 30 days), without room and board, per diem	X			X			
HCPCS	H0015	Alcohol and/or drug services; intensive outpatient (treatment program that operates at least 3 hours/day and at least 3 days/week and is based on an individualized treatment plan), including assessment, counseling; crisis intervention, and activity therapies or education		X		X			
HCPCS	H0017	Behavioral health; residential (hospital residential treatment program), without room and board, per diem		X		X			
HCPCS	H0035	Mental health partial hospitalization, treatment, less than 24 hours		X		X			
HCPCS	S9480	Intensive outpatient psychiatric services, per diem		X		X			
CPT	90791	Psychiatric diagnostic evaluation			X	X			
CPT	90792	Psychiatric diagnostic evaluation with medical services			X	X			
CPT	90832	Psychotherapy, 30 minutes with patient			X	X			

Type	Code	Definition	M 2.6.1	M 2.6.2	M 2.6.3	M 2.6.4	M 2.6.5	M 2.6.6	M 2.6.7
CPT	90833	Psychotherapy, 30 minutes with patient when performed with an evaluation and management service (List separately in addition to the code for primary procedure)			X	X			
CPT	90834	Psychotherapy, 45 minutes with patient			X	X			
CPT	90836	Psychotherapy, 45 minutes with patient when performed with an evaluation and management service (List separately in addition to the code for primary procedure)			X	X			
CPT	90837	Psychotherapy, 60 minutes with patient			X	X			
CPT	90838	Psychotherapy, 60 minutes with patient when performed with an evaluation and management service (List separately in addition to the code for primary procedure)			X	X			
CPT	90839	Psychotherapy for crisis; first 60 minutes			X	X			
CPT	90845	Psychoanalysis			X	X			
CPT	90846	Family psychotherapy (without the patient present), 50 minutes			X	X			
CPT	90847	Family psychotherapy (conjoint psychotherapy) (with patient present), 50 minutes			X	X			
CPT	90849	Multiple-family group psychotherapy			X	X			
CPT	90853	Group psychotherapy (other than of a multiple-family group)			X	X			
CPT	90863	Psychopharmacology with therapy			X	X			
CPT	90865	Narcosynthesis			X	X			
CPT	90875	Individual psychophysiological therapy incorporating biofeedback training, 30 minutes			X	X			
CPT	90876	Individual psychophysiological therapy incorporating biofeedback, 45 minutes			X	X			
CPT	90877	Psychiatric hypnotherapy, 15 min			X	X			
CPT	90882	Environmental manipulation			X	X			

Type	Code	Definition	M 2.6.1	M 2.6.2	M 2.6.3	M 2.6.4	M 2.6.5	M 2.6.6	M 2.6.7
CPT	97810	Acupuncture, one or more needles, without electrical stimulation, initial 15 minutes of personal one-on-one contact with the patient			X	X			
CPT	97811	Each additional 15 minutes of personal one-on-one contact with the patient, with re-insertion of needles			X	X			
CPT	99201	Office or other outpatient visit for the evaluation and management of a new patient (10 minutes)			X	X			
CPT	99202	Office or other outpatient visit for the evaluation and management of a new patient (20 minutes)			X	X			
CPT	99203	Office or other outpatient visit for the evaluation and management of a new patient (30 minutes)			X	X			
CPT	99204	Office or other outpatient visit for the evaluation and management of a new patient (45 minutes)			X	X			
CPT	99205	Office or other outpatient visit for the evaluation and management of a new patient (60 minutes)			X	X			
CPT	99211	Office or other outpatient visit for the evaluation and management of an established patient (10 minutes)			X	X			
CPT	99212	Office or other outpatient visit for the evaluation and management of an established patient (15 minutes)			X	X			
CPT	99213	Office or other outpatient visit for the evaluation and management of an established patient (15 minutes)			X	X			
CPT	99214	Office or other outpatient visit for the evaluation and management of an established patient (25 minutes)			X	X			
CPT	99215	Office or other outpatient visit for the evaluation and management of an established patient (40 minutes)			X	X			
HCPCS	G0396	Alcohol and/or substance (other than tobacco) abuse structured assessment (e.g., AUDIT, DAST), and brief intervention 15 to 30 minutes			X	X			

Type	Code	Definition	M 2.6.1	M 2.6.2	M 2.6.3	M 2.6.4	M 2.6.5	M 2.6.6	M 2.6.7
HCPCS	G0397	Alcohol and/or substance (other than tobacco) abuse structured assessment (e.g., AUDIT, DAST), and intervention, greater than 30 minutes			X	X			
HCPCS	G0463	Hospital outpatient clinic visit for assessment and management of a patient			X	X			
HCPCS	G0466	Federally qualified health center (FQHC) visit, new patient; a medically necessary, face-to-face encounter (one-on-one) between a new patient and a fqhc practitioner during which time one or more fqhc services are rendered and includes a typical bundle of Medicare-covered services that would be furnished per diem to a patient receiving a fqhc visit			X	X			
HCPCS	G0467	Federally qualified health center (fqhc) visit, established patient; a medically necessary, face-to-face encounter (one-on-one) between an established patient and a fqhc practitioner during which time one or more fqhc services are rendered and includes a typical bundle of Medicare-covered services that would be furnished per diem to a patient receiving a fqhc visit			X	X			
HCPCS	G0469	Federally qualified health center (fqhc) visit, mental health, new patient; a medically necessary, face-to-face mental health encounter (one-on-one) between a new patient and a fqhc practitioner during which time one or more fqhc services are rendered and includes a typical bundle of Medicare-covered services that would be furnished per diem to a patient receiving a mental health visit			X	X			

Type	Code	Definition	M 2.6.1	M 2.6.2	M 2.6.3	M 2.6.4	M 2.6.5	M 2.6.6	M 2.6.7
HCPCS	G0470	Federally qualified health center (fqhc) visit, mental health, established patient; a medically necessary, face-to-face mental health encounter (one-on-one) between an established patient and a fqhc practitioner during which time one or more fqhc services are rendered and includes a typical bundle of Medicare-covered services that would be furnished per diem to a patient receiving a mental health visit			X	X			
HCPCS	H0004	Behavioral health counseling and therapy, per 15 minutes			X	X			
HCPCS	H0005	Alcohol and/or drug services; group counseling by a clinician			X	X			
HCPCS	H0014	Alcohol and/or drug services; ambulatory detoxification			X	X			
HCPCS	H0016	Alcohol and/or drug services; medical/somatic (medical intervention in ambulatory setting)			X	X			
HCPCS	H0022	Alcohol and/or drug intervention service (planned facilitation)			X	X			
HCPCS	H0023	Behavioral health outreach service (planned approach to reach a targeted population)			X	X			
HCPCS	H0031	Mental health assessment, by non-physician			X	X			
HCPCS	H0032	Mental health service plan development by non-physician			X	X			
HCPCS	H0033	Oral medication administration, direct observation			X	X			
HCPCS	H0036	Community psychiatric supportive treatment, face-to-face, per 15 minutes			X	X			
HCPCS	H0037	Community psychiatric supportive treatment program, per diem			X	X			
HCPCS	H0046	Mental health services, not otherwise specified			X	X			
HCPCS	H0047	Alcohol and/or other drug abuse services, not otherwise specified			X	X			
HCPCS	H0050	Alcohol and/or drug services, brief intervention, per 15 minutes			X	X			
HCPCS	H2000	Comprehensive multidisciplinary evaluation			X	X			

Type	Code	Definition	M 2.6.1	M 2.6.2	M 2.6.3	M 2.6.4	M 2.6.5	M 2.6.6	M 2.6.7
HCPCS	H2001	Rehabilitation program, per 1/2 day			X	X			
HCPCS	H2010	Comprehensive medication services, per 15 minutes			X	X			
HCPCS	H2012	Behavioral health day treatment, per hour			X	X			
HCPCS	H2013	Psychiatric health facility service, per diem			X	X			
HCPCS	H2014	Skills training and development, per 15 minutes			X	X			
HCPCS	H2015	Comprehensive community support services, per 15 minutes			X	X			
HCPCS	H2016	Comprehensive community support services, per diem			X	X			
HCPCS	H2017	Psychosocial rehabilitation services, per 15 minutes			X	X			
HCPCS	H2018	Psychosocial rehabilitation services, per diem			X	X			
HCPCS	H2019	Therapeutic behavioral services, per 15 minutes			X	X			
HCPCS	H2020	Therapeutic behavioral services, per diem			X	X			
HCPCS	H2021	Community-based wrap-around services, per 15 minutes			X	X			
HCPCS	H2022	Community-based wrap-around services, per diem			X	X			
HCPCS	H2023	Supported employment, per 15 minutes			X	X			
HCPCS	H2024	Supported employment, per diem			X	X			
HCPCS	H2024	Supported employment, per diem			X	X			
HCPCS	H2025	Ongoing support to maintain employment, per 15 minutes			X	X			
HCPCS	H2026	Ongoing support to maintain employment, per diem			X	X			
HCPCS	H2027	Psychoeducational service, per 15 minutes			X	X			
HCPCS	H2032	Activity therapy, per 15 minutes			X	X			
HCPCS	H5030	Other services by social worker, psych nurse, etc., per hour			X	X			
HCPCS	H5299	Rehabilitative evaluation, not otherwise classified			X	X			
HCPCS	S9454	Stress management classes, non-physician provider, per session			X	X			

Type	Code	Definition	M 2.6.1	M 2.6.2	M 2.6.3	M 2.6.4	M 2.6.5	M 2.6.6	M 2.6.7
HCPCS	S9475	Ambulatory setting substance abuse treatment or detoxification services, per diem			X	X			
HCPCS	T1006	Alcohol and/or substance abuse services, family/couple counseling			X	X			
HCPCS	T1012	Alcohol and/or substance abuse services, skills development			X	X			
HCPCS	T1015	Clinic visit/encounter, all-inclusive			X	X			
HCPCS	T1023	Screening to determine the appropriateness of consideration of an individual for participation in a specified program, project or treatment protocol, per encounter			X	X			
HCPCS	T1040	Medicaid certified community behavioral health clinic services, per diem			X	X			
HCPCS	T1041	Medicaid certified community behavioral health clinic services, per month			X	X			
HCPCS	T2010	Preadmission screening and resident review (PASRR) level i identification screening, per screen			X	X			
HCPCS	T2011	Preadmission screening and resident review (PASRR) level ii evaluation, per evaluation			X	X			
HCPCS	H0006	Alcohol and/or drug services; case management					X		X
HCPCS	H2015	Comprehensive community support services, per 15 minutes					X		X

Type	Code	Definition	M 2.6.1	M 2.6.2	M 2.6.3	M 2.6.4	M 2.6.5	M 2.6.6	M 2.6.7
HCPCS	G0502	Initial psychiatric collaborative care management, first 70 minutes in the first calendar month of behavioral health care manager activities, in consultation with a psychiatric consultant, and directed by the treating physician or other qualified health care professional, with the following required elements: outreach to and engagement in treatment of a patient directed by the treating physician or other qualified health care professional; initial assessment of the patient, including administration of validated rating scales, with the development of an individualized treatment plan; review by the psychiatric consultant with modifications of the plan if recommended; entering patient in a registry and tracking patient follow-up and progress using the registry, with appropriate documentation, and participation in weekly caseload consultation with the psychiatric consultant; and provision of brief interventions using evidence-based techniques such as behavioral activation, motivational interviewing, and other focused treatment strategies					X		X

Type	Code	Definition	M 2.6.1	M 2.6.2	M 2.6.3	M 2.6.4	M 2.6.5	M 2.6.6	M 2.6.7
HCPCS	G0503	Subsequent psychiatric collaborative care management, first 60 minutes in a subsequent month of behavioral health care manager activities, in consultation with a psychiatric consultant, and directed by the treating physician or other qualified health care professional, with the following required elements: tracking patient follow-up and progress using the registry, with appropriate documentation; participation in weekly caseload consultation with the psychiatric consultant; ongoing collaboration with and coordination of the patient's mental health care with the treating physician or other qualified health care professional and any other treating mental health providers; additional review of progress and recommendations for changes in treatment, as indicated, including medications, based on recommendations provided by the psychiatric consultant; provision of brief interventions using evidence-based techniques such as behavioral activation, motivational interviewing, and other focused treatment strategies; monitoring of patient outcomes using validated rating scales; and relapse prevention planning with patients as they achieve remission of symptoms and/or other treatment					X		X
HCPCS	T1016	Case management, each 15 minutes					X		X
HCPCS	T1017	Targeted case management, each 15 minutes					X		X
HCPCS	T2023	Targeted case management; per month					X		X
HCPCS	H0038	Self-help/peer services, per 15 minutes						X	X
HCPCS	H2016	Comprehensive community support services, per diem						X	X

HCPCS = Healthcare Common Procedure Coding System; CPT = Current Procedural Terminology; POS = place of service.

Appendix G. Health Economics Measure Population Subgroup Definitions

The following subgroups were collected for the purposes of accounting for changes in use of Medicaid services in association with the Communities That HEAL (CTH) intervention, by different subpopulations which had different expectations of intervention impact based on the characteristics of the subgroup. The full set of four subgroups are mutually exclusive. Ultimately, these measures contribute to the estimation of costs associated with the CTH intervention.

Population Subgroup	Subgroup Definitions
Subgroup 1	Number of individuals with OUD in measurement period OR in 12 months prior; OUD diagnosis list: F11.1X, F11.2X (any listed)
Subgroup 2	Number of individuals with MOUD in measurement period OR in 12 months prior **(excluding subgroup 1)**; this includes sublingual buprenorphine for OUD fills; for National Drug Codes (NDCs), please see ***Appendix C*** for a description of how NDCs were included in the measure; NDCs were updated quarterly by the HCS team using the Medi-Span Electronic Drug File (MED-File) v2 for active and inactive products (Wolter Kluwer, 2020) OR office-administered sublingual buprenorphine for OUD (procedure codes may vary by state: use procedure codes and qualifying criteria that reflect state policy OR buprenorphine injections for OUD (procedure codes may vary by state: use procedure codes and qualifying criteria that reflect state policy; for National Drug Codes (NDCs), please see ***Appendix C*** for a description of how NDCs were included in the measure OR methadone administration for OUD (use procedure codes to identify office-based methadone; states should use MOUD procedure codes and criteria that best reflect state methadone policy and coding; for site specific information on MOUD procedure codes, see ***Appendix E***
Subgroup 3	Number of individuals with opioid pain medication fill in measurement period OR in 12 months prior **(excluding subgroups 1 and 2)**; for National Drug Codes (NDCs), please see ***Appendix C*** for a description of how NDCs were included in the measure
Subgroup 4	All other individuals **(excluding subgroups 1, 2, and 3)**